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ENTRIES 859-1446

AGRONOMY

C. V. PIPER, *Editor*
MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 953, 999, 1001, 1015, 1024, 1048, 1054, 1286, 1303, 1306, 1311, 1320, 1353, 1356, 1358, 1367, 1370, 1371, 1372)

859. ANONYMOUS. **A textile fiber from the hibiscus.** Sci. Amer. Monthly 3: 132. 1921.—The article concerns *Hibiscus cannabinus*.—*C. H. Otis.*

860. ANONYMOUS. **Cane arrowing. [Rev. of an interview of H. T. Easterby, in the "Mercury," an Australian newspaper.]** Australian Sugar Jour. 13: 283. 1921.—The conditions which produce arrowing, or flowering of the cane plant, in the cooler cane-growing areas are not well understood but are mostly attributable to climatic factors. Experiments at the Sugar Experiment Station at Mackay with arrowed and non-arrowed plants of the same variety and age gave a slight yield in favor of the arrowed plants in both the plant and first rattoon crops. A higher percentage of sugar is extracted from the cane in the Ingham-Mourilyan district, where arrowing is usual, than anywhere else in Queensland, except the Lower Burdekin; consequently arrowing conditions need not be greatly feared. Any decrease in the sugar content of the cane in 1921 will probably be due to the great amount of rain late in the season.—*C. Rumbold.*

861. ANONYMOUS. **Cotton research in Egypt.** Sci. Amer. Monthly 2: 356. 1920.—A brief is given of a preliminary report of the Cotton Research Board, Ministry of Agriculture, Cairo, Egypt.—*Chas. H. Otis.*

862. ANONYMOUS. **The world's supply of wheat.** Science 54: 268–269. 1921.—An aggregate estimate is given of the 1921 wheat harvest for 20 countries, according to figures compiled by the U. S. Bureau of Markets and Crop Estimates. The 20 countries included in the estimate are: Canada, Argentina, Chile, Uruguay, Belgium, Bulgaria, Finland, France, Greece, Hungary, Italy, Spain, British India, Japan, Algeria, Tunis, Union of South Africa, Australia, New Zealand, and the U.S.A. A brief comment is made on the wheat prospects for the world. —*Mary R. Burr.*

863. ANONYMOUS. **Varieties of maize and potatoes.** Agric. Gaz. New South Wales 32: 533–535. 1921.—Maize districts are classified and varieties are recommended for various districts. A list of recommended potato varieties is given for different districts.—*L. R. Waldron.*

864. Aston, B. C. **Improvement of poor pasture.** New Zealand Jour. Agric. 21: 192–195. *2 charts.* 1921.—The experiments were made to determine the best method of improving shallow pasture which dries up to a dangerous degree in summer. Five-acre plots were treated with basic slag, limestone rubble and phosphate, limestone rubble, or basic phosphate. Sheep were used to determine the relative value of pasture. The basic slag gave excellent and immediate results while the limestone alone was of least value.—*N. J. Giddings.*

865. Bevan, W. **A new fodder plant, Kudzu (Pueraria thunbergiana).** Cyprus Agric. Jour. 16: 33–34. 1921.—This woody leguminaceous climber has recently attracted attention as a forage crop. In Japan, where it is native, seldom maturing seed elsewhere, it has many uses. The thick roots contain large quantities of starch, used for human food; the stems contain a fine fibre from which cloth is manufactured; while the foliage is valued as fodder for all kinds of stock, horses being especially fond of it. The usual method of establishing a field of Kudzu is to set nursery-propagated plants 10 feet apart each way in the early spring. In some cases the stems attain a length of 60 feet in 3 months.—*W. Stuart.*

866. Bevan, W. **Notes on hemp cultivation.** Cyprus Agric. Jour. 16: 12–14. 1921.—The hemp field is known in Cyprus as "kanavero." Soil of a clayey nature is said to be preferred by the hemp growers. Land intended for hemp is given a deep ploughing after the 1st rain; the 2nd ploughing takes place in October or January; a 3rd ploughing is made a few days before sowing the crop, usually in April or May. After thorough harrowing and levelling the field is irrigated and in about 5 days the seed is sown. Complete instructions as to amount of seed to sow, subsequent cultivation of the plants, cutting and removal of seed, and retting of the hemp are given.—*W. Stuart.*

867. Bevan, W. **Sudan grass.** Cyprus Agric. Jour. 16: 6. 1921.—This excellent fodder grass, if irrigated, gives 3 or 4 cuttings a season; but it also gives a fair yield if not irrigated.—*W. Stuart.*

868. Bevan, W. **The value of seed testing.** Cyprus Agric. Jour. 16: 30–31. 1921.—A small seed-testing station has lately been formed at the Agricultural Department, Nicosia. The writer states that "the object of the tests to be carried out is to ascertain the germinating power of the various seeds belonging to the Department before they are issued out to the public." The Department agrees to undertake, so far as it can, to test without charge the seed sent in by farmers.—*W. Stuart.*

869. Breakwell, E. **Elephant grass [Pennisetum purpureum] at North Ryde.** Agric. Gaz. New South Wales 32: 552. 1921.

870. Breakwell, E. **Popular descriptions of grasses.** Agric. Gaz. New South Wales 32: 537–542. *3 fig.* 1921.—Brief notes are given on species of *Aristida, Hordeum,* and *Agropyron. Aristida Behriana, Hordeum murinum, H. maritimum, Agropyron scabrum,* and *A. pectinatum* are figured. *Hordeum bulbosum,* a perennial, promises well as a cultivated grass. Under cultivation it grows 6 feet tall and yields well.—*L. R. Waldron.*

871. Breakwell, E. **Some germination tests of prickly pear seeds.** Agric. Gaz. New South Wales 32: 579–580. 1921.—Seeds of *Opuntia* spp. were subjected to various treatments and then tested for germination; control lots were also tested. Seeds retained their viability for a period of at least 4 years. Different preparatory treatments did not increase germinating capacity. The work is being continued.—*L. R. Waldron.*

872. Brown, P. E. **The American Society of Agronomy.** Science 53: 344–346. 1921.—Abstracts are presented of papers read at a symposium, "Our present knowledge of methods of corn breeding," held at the Chicago meeting of the society, Dec., 1920.—*C. J. Lyon.*

873. Burkill, I. H. **A note upon plants grown for blue dyes in the north of the Malay Peninsula.** Gardens' Bull. Straits Settlements 2: 426–429. 1921.—The history of indigo growing in the East, and the cultivation of *Indigofera suffruticosa* Mill., *Strobilanthes flaccidifolius* Nees, and *Marsdenia tinctoria* R. Br. within the Malay Peninsula are discussed.—*I. H. Burkill.*

874. CALVINO, MARIO. **El cultivo del maní en Cuba. [The cultivation of peanuts in Cuba.]** Rev. Agric. Com. y Trab. [Cuba] 3: 404–408. *4 fig.* 1920.—Preliminary experiments showed that castration of peanut plants did not increase yields. Seed selected from pods containing 2 or more grains yielded twice as much as those from pods containing 1 seed. The addition of lime and stable manure to the soil very materially increased the yield.—*F. M. Blodgett.*

875. CALVINO, MARIO. **Interesantes ensayos de abonos en el cultivo de la caña. [Fertilizer experiments with sugar cane.]** Rev. Agric. Com. y Trab. [Cuba] 4: 468–471. *1 fig.* 1921.

876. CALVINO, MARIO. **Interesantes ensayos de encalado en cultivos de frijol negro y de frijol de lima. [Liming experiments with black kidney beans and lima beans.]** Rev. Agric. Com. y Trab. [Cuba] 3: 448–449. *1 fig.* 1921.

877. CALVINO, MARIO. **La caña Uba del Natal. [The Uba sugar cane of Natal.]** Rev. Agric. Com. y Trab. [Cuba] 4: 504–511. *4 fig.* 1921.—Analyses and yields of the Uba sugar cane compared with other varieties are given.—*F. M. Blodgett.*

878. CALVINO, MARIO. **Nuevas variedades de caña de azúcar. [New varieties of sugar cane.]** Rev. Agric. Com. y. Trab. [Cuba] 3: 436–440. *7 fig.* 1921.—An account is given of the results of tests of sugar cane seedlings at the Agronomy Experiment Station of Cuba, including total yield and yield of sugar. Tables are included showing the analyses of the different seedlings.—*F. M. Blodgett.*

879. CALVINO, MARIO. **Nuevo sistema de siembra para la caña. [A new system of planting sugar cane.]** Rev. Agric. Com. y Trab. [Cuba] 4: 500–503. *3 fig.* 1921.—Better yields of sugar cane were secured by removing all but 1 central bud from the pieces used for planting and planting this piece with the bud turned upward.—*F. M. Blodgett.*

880. CALVINO, MARIO. **Tratamientos especiales de los trozos de caña que se siembran. [Special treatments of pieces of sugar cane used for seed.]** Rev. Agric. Com. y Trab. [Cuba] 4: 512–515. *6 fig.* 1921.—Pieces of sugar cane used for seed were treated in camphor water, cold water, water at 40°C. for 2 hours, water at 50°C. for ½ hour, and water at 60°C. for 10 minutes. The last treatment gave the best sprouting.—*F. M. Blodgett.*

881. CANFIELD, F. D., AND ABEL G. RIOS. **Cane sugar in Mexico. Louisiana Planter** 66: 11–15. *4 fig.* 1921.—The authors discuss the sugar cane industry in Mexico, including methods of growing and harvesting.—*C. W. Edgerton.*

882. COCKAYNE, L. **An economic investigation of the montane tussock-grassland of New Zealand.** New Zealand Jour. Agric. 21: 176–188. *Fig. 1–8.* 1921.—The objects of these experiments, methods of securing data, and the value of results are discussed. The central Otago palatability experiment is described in detail as to soil character, climatic conditions, plants occurring in various parts of the field, and the relative palatability of these plants for sheep.—*N. J. Giddings.*

883. COCKAYNE, L. **An economic investigation of the montane tussock-grassland of New Zealand.** New Zealand Jour. Agric. 21: 324–334. *4 fig.* 1921.—Details are given concerning the relative palatability of the various plants occurring in the central Otago experiment.—*N. J. Giddings.*

884. CORBOULD, MABEL K. **Standardization of wheat varieties.** Monthly Bull. Ohio Agric. Exp. Sta. 6: 116–119. 1921.—The culture of certain new selections would improve the wheat yield in Ohio. A table is given of the relative baking and milling qualities of the Gladden and Red Wave varieties. The growing of such varieties as Gladden, Trumbull, Portage, Poole, Fultz, Goens, Harvest King, Hickman, Valley, and Nigger is urged.—*R. C. Thomas.*

885. CROOKS, J. T. J. **The cultivation of sugar cane and the manufacture of raw sugar in the Philippine Islands.** Internat. Sugar Jour. 23: 498–499. 1921.—For years sugar cane has been grown in the Philippines on the island of Negros, Panay, Mindoro, and Luzon. Recently

centrifugal sugar of 96° polarization has been made in 3 or 4 centrals controlled by American and Spanish capital. The cane cultivated is mostly native and little has been done to improve the crop. On Mindoro, the owners of the central have obtained good results by planting new varieties and using fertilizers. The islands have an ideal climate and great supply of suitable land for growing cane, but labor is scarce.—*C. Rumbold.*

886. Ducomet, V. **A propos des semis de pommes de terre. [Concerning potato seed.]** Jour. Soc. Nation. Hort. France 22: 126–131. 1921.—The author discusses the theory of degeneracy in plants propagated asexually and gives results secured from potato seed. He concludes that the evidence does not justify the belief that sexual reproduction is necessary to the maintenance of vigor and productivity. In his experiments a large percentage of the potatoes produced from seed were inferior to the female parent, morphologically, physiologically, and pathologically.—*H. C. Thompson.*

887. Frierson, L. S. **The value of tilth in agriculture.** Science 54: 193–194. 1921.—Stimulation of plant growth by cultivating the soil, so far as movement of the soil water is concerned, is attributed to moisture conservation and to the fact that minerals left at the surface by evaporation, inaccessible to the feeding roots, are, by cultivation, moved to the subsurface where the roots can utilize them.—*H. L. Westover.*

888. Gaylord, F. C. **Why not good potatoes?** Gard. Mag. 32: 310–312. *5 fig.* 1921.—The author briefly discusses seed selection and methods used in growing potatoes, including varieties, disease treatment, and cultural practices.—*H. C. Thompson.*

889. Gennys, R. H. **Harvest report. Glen Innes experiment farm.** Agric. Gaz. New South Wales 32: 578. 1921.—Yields of 4 wheat and 4 oat varieties are given.—*L. R. Waldron.*

890. Girola, Carlos D. **Destrucción de las plantes invasoras perjudiciales, vivaces y anuales. Instrucciones a los agricultores de la dirección de agricultura de la Republica Argentina. [Destruction of weeds.]** Rev. Agric. Com. y Trab. [Cuba] 3: 383–386. 1920.

891. Good, E. S., L. J. Horlacher, and J. C. Grimes. **A comparison of corn silage and sorghum silage for fattening steers.** Kentucky Agric. Exp. Sta. Bull. 233. *59–89* 1921.—A report is given of a 5-year study of the value of corn and sorghum as silage for feeding steers, considered from the standpoint of yield and cost of production. As regards economy in beef production, sorghum silage proved 92.2 per cent as economical as corn silage.—*W. D. Valleau.*

892. Gouaux, C. B. **Summary of results of fertilizer and other field work with sugar cane for 1919–1920.** Louisiana State Univ. Div. Agric. Ext. Circ. 47. *20 p.* 1921.—Results of fertilizer experiments with sugar cane on various plantations in Louisiana are given.—*C. W. Edgerton.*

893. Green, A. W. **Grass-grub control.** New Zealand Jour. Agric. 21: 174–175. 1920.—The grass-grub (*Odontria zealandica*) is often destructive in small areas of pasture land. Fencing such areas and using them as feed lots for heavy live stock has been found to destroy practically all grubs.—*N. J. Giddings.*

894. Helm, C. A. **Corn in Missouri. II. Field methods that increase the corn crop.** Missouri Agric. Exp. Sta. Bull. 185. *20 p.* 1921.—Experiments on tillage and method and rate of planting and comparative yield tests of corn are briefly discussed.—*L. J. Stadler.*

895. Heriot, T. H. P. **The manufacture of sugar from the cane and beet.** *Illus.* Monographs on Industrial Chemistry. Longmans, Green and Co.: London, 1920.—Part 1. Sugar beet, sugar cane, and other sugar-producing plants. Part 2. Extraction of juice from the cane: principles of the milling process. Part 3. Extraction of sugar from the beet: principles of the diffusion process. Part 4. Composition of cane and beet juices: properties of the sugars. Part 5. Treatment of cane and beet juices: chemical agents used and method of heating the

juice. Part. 6. Evaporation of water from juice: principles of multiple-effect evaporation; types of evaporators used. Part 7. Crystallization: formation and growth of crystals; crystallizing operations. Part 8. Special methods of extracting sugar from molasses: treatment of beet-molasses. Part 9. By-products of cane and sugar-beet factories. Part 10. Refining of cane and beet sugars.—*C. Rumbold.*

896. Hertel, H. **Landbruget i 1920.** [Agriculture during 1920.] Tidsskr. Landøkonomi 1921 [1]: 1–38. 1921.—The 1920 harvest for the entire nation is stated as follows in millions of dobbeltcentner (200 pounds): Wheat 1.89, rye 3.20, barley 5.13, oats 6.84, buckwheat 0.02. Denmark is endeavoring to raise clover seed for export, but during 1920 the quantity harvested was insufficient even for domestic needs. Experiments with clover seed from Bohemia have demonstrated that the resulting seed is not as good as Danish seed.—*Albert A. Hansen.*

897. Kinney, E. J., and George Roberts. **Soybeans.** Kentucky Agric. Exp. Sta. Bull. 232. *23–58.* 1921.—This bulletin reports results of a study of soy beans in Kentucky over a period of more than 7 years. A discussion is given of the utility of the soy bean crop, its value under different conditions as compared with cowpeas, varieties,—with description of the most important ones,—yields of seed and hay, the place of the soy bean in the rotation, culture of soy beans, care of the crop and of soy beans in mixture with corn and other crops. A discussion is also included of the value of soy beans for silage. It is pointed out that soy beans will give good yields on poor fields, which will not successfully raise red clover, thus supplanting clover in the rotation.—*W. D. Valleau.*

898. Liechti, P., und E. Ritter. **Ueber die Wiesendüngung mit Güile unter besonderer Berücksichtigung der Verwertung des Güllenstickstoffs bei der Grünfuttererzeugung. [Pasture fertilization with liquid manure, with special reference to the utilization of the nitrogen in the production of green feed.]** Landw. Jahrb. Schweiz **35**: 1–66. 1921.—This describes plat experiments with liquid manure and other fertilizers for the period 1911–1918, inclusive, in a study of the effect of fertilizer treatment on yield and composition of pasture grasses. Considerable tabulated data are presented giving the results of chemical analyses of the dry matter produced under the various fertilizer treatments.—*J. D. Luckett.*

899. McDonald, A. H. E. **Trial of Jerusalem artichokes.** Agric. Gaz. New South Wales **32**: 587. 1921.—It was found at Wollongbar Experiment Farm that artichokes can not compete with sweet potatoes as fodder for pigs. Sweet potatoes yield more, remain in the ground without rotting, and the surplus crop, if any, can be marketed. Artichokes were found to be more sucessful at Hawkesbury.—*L. R. Waldron.*

900. McGill, J. **British grasses.** *65 pl.* McGill and Smith, Ltd.: Ayr, Scotland, 1920.—Photographic illustrations of 65 species of British grasses are given, each plate labeled with the common and scientific names and with brief notes of the habit and agricultural value of the grass.—*C. V. Piper.*

901. Maiden, J. H. **Newly recorded weeds.** Agric. Gaz. New South Wales **32**: 580. 1921.—*Amaranthus deflexus* and *Xanthium commune* are reported as new to the Commonwealth.—*L. R. Waldron.*

902. Mathieu, E. H. **An experiment with Sorghum vulgare, the Great Millet or Juar, from the Bombay Presidency.** Gardens' Bull. Straits Settlements **2**: 423–426. *1 pl.* 1921.—A race of *Sorghum vulgare* from the Tapti valley in western India was found to grow and produce grain freely in Singapore, while another from Ahmednagar, also in western India, ran to leaf. The former strangely enough gave the largest yields after transplanting.—*I. H. Burkill.*

903. Mathieu, E. [H.] **Roselle fibre.** Agric. Bull. Federated Malay States **8**: 231–241. 1920 [1921].—The cultivation and fiber-value of *Hibiscus sabdariffa* var. *altissima* are discussed.—*I. H. Burkill.*

904. Millton, E. B. **Sorrel in turnip on light land.** New Zealand Jour. Agric. **21**: 252–253. 1920.—Sheep will eat the sorrel but will not injure the turnips if care is taken not to overstock and to withhold the animals when the turnips first appear. These results are based on several years experience.—*N. J. Giddings.*

905. Morse, Stanley F. **Sour clover and cane.** Facts about Sugar **13**: 150. 1921.—An enumeration is presented of the increased yields of sugar cane obtained in Louisiana by planting sour clover (*Melilotus indica*) on the rows as a winter cover crop.—*C. W. Edgerton.*

906. Morse, W. J. **La industria del "soy bean" en los Estados Unidos. [The soy bean in the United States.]** Rev. Agric. Com. y Trab. [Cuba] **4**: 521–524. 1921.—[Translated from the Yearbook of the U. S. Department of Agriculture, 1917.]

907. Piper, C. V. **Plants and plant culture.** Science **53**: 269–279. 1921.—Address delivered in the joint program of the American Society of Agronomy, Botanical Society of America, and American Phytopathological Society, Chicago, Dec. 30, 1920, is here printed.—*C. J. Lyon.*

908. Rahman Abdul. **Padi cultivation in Pahang.** Agric. Bull. Federated Malay States **8**: 176–178. 1920 [1921].—The method of growing rice in the state of Pahang, Malay Peninsula.—*I. H. Burkill.*

909. Robison, W. L. **Forages for swine.** Monthly Bull. Ohio Agric. Exp. Sta. **6**: 46–50. 1921.—The value is given of field peas and oats, field peas and rape, also other forages,—sweet clover, soy bean, and red clover,—with rape pasture, compared with rape alone.—*R. C. Thomas.*

910. Roemer, T. **Steigerung der Wiesenerträge durch Auswahl des Saatgutes. [Increasing the yield from meadows by seed selection.]** Mitteil. Deutsch. Landw. Ges. **36**: Flugbl. 59. *4 p.* [April 9.] 1921.—The author reports on a 4-year trial of orchard grass and timothy seed from different sources. Orchard grass seed from Holland gave the largest total yield; that from America nearly the same. Attention is called to the morphological and other differences between these lots,—plants from Australian seed being dwarf and better adapted to pasture mixtures, while those from American and Holland seed were tall.—Timothy seed of Finnish origin and that from Galicia gave the best results; the American, the poorest. Some selection work was done with timothy and with *Festuca pratensis*; the author illustrates the possibilities of this work by giving a table showing the 3-year yields from individual plants.—*A. J. Pieters.*

911. Roemer, T. **Steigerung der Wiesenerträge durch Auswahl des Saatgutes. [Increasing the yield from meadows by seed selection.]** Illus. Landw. Zeitg. **41**: 1–2. 1921.—[See preceding entry.]

912. Stoa, Theodore E. **Varietal trials with spring wheat in North Dakota.** North Dakota Agric. Exp. Sta. Bull. 149. *55 p., 4 fig.* 1921.—Results of varietal trials are reported for 7 stations in North Dakota: Fargo, Edgeley, Dickinson, Hettinger, Langdon, Williston, and Mandan. Precipitation and temperature data are given for the different stations. At the Fargo station yields given for a few varieties begin with 1892; most yields given begin with 1901. Stem rust and drought have greatly influenced yields. Marquis has proved distinctly superior to other varieties of common wheat in the eastern and southern portions, and somewhat superior in the central and southwestern sections; in the northwestern section, Marquis has been outyielded by Power. The larger yields of Marquis were due partly, if not wholly, to its greater earliness, thus escaping in part rust epidemics and effects of hot weather. Bread produced from Marquis flour is superior to that produced from other varieties commercially available. The data do not indicate that any exploited new varieties, such as Kitchener, Ruby, and Red Bobs, can replace Marquis in North Dakota. The new variety,

Kota, a common wheat, has proved strongly rust resistant, is evidently resistant to drought, has yielded well, and has proved to be a first class milling and baking wheat.—Durum wheats generally have outyielded common wheats. They are more vigorous growers and generally more resistant to drought and rust. Durum wheat flour is lacking in strength of gluten. Of the Durum varieties, Kubanka is superior to Arnautka. Monad and Acme, 2 new varieties strongly resistant to stem rust, have decidedly outyielded Kubanka. The red Durum, D-5, is strongly resistant to stem rust but is decidedly inferior in milling and baking value and for the manufacture of edible pastes.—*L. R. Waldron.*

913. THATCHER, L. E. **Rate of seeding as affecting yields of wheat.** Monthly Bull. Ohio Agric. Exp. Sta. 6: 111–115. 1921.—The author gives a report of yields from various sections of the state where seedings were made at rates varying from 3 to 10 pecks per acre. Using these as a basis, brief discussions are given of the relation of rates of seeding to richness of soil and to tillering.—*R. C. Thomas.*

914. THORNE, C. E. **Fertilizing the corn crop.** Monthly Bull. Ohio Agric. Exp. Sta. 6: 35–37. 1921.—Records of increases in yield of corn in a 5-year rotation of corn, oats, wheat, clover, and timothy show that where acid phosphate and other fertilizers are used, a period is reached in which something besides commercial fertilizers is needed. The cheapest and most effective commercial carriers of nitrogen and potassium are nitrate of soda and muriate of potash. Moreover, barnyard manure, reinforced with acid phosphate at the rate of 40 pounds per ton of manure and spread upon the land during the winter at the rate of 8 tons per acre, has given in a 3-year rotation of corn, wheat, and clover an average annual income of $16.71 against $10.39 per annum for the most effective chemical fertilizer.—*R. C. Thomas.*

915. THORNE, C. E. **Fertilizing the wheat crop.** Monthly Bull. Ohio Agric. Exp. Sta. 6: 99–107. 1921.—The article includes a discussion of the following important factors in economy in wheat production: Adjustment of rotation, early and thorough preparation of seed bed, selection of variety, liberal use of seed, and liberal fertilizing.—*R. C. Thomas.*

916. THORNE, C. E. **Thirty-ninth annual report.** Ohio Agric. Exp. Sta. Bull. 346. *vii–xxxx.* 1921.—The report includes a discussion of the following experiments: (1) Phosphorus combinations and availability in soils; (2) relation of soil supply of phosphorus and nitrogen to the protein and carbohydrates of wheat; (3) sulphur requirements of crops; (4) physiology of nitrification; (5) *Azotobacter* studies; (6) increase and fixation of desirable qualities in cereals; (7) study of variation in pure lines of winter wheat; (8) sulphofication in relation to ammonification and nitrification; (9) factors relating to the lodging of the small grains; (10) procedure for measuring possible changes in soil potassium produced by treatment and cropping.—*R. C. Thomas.*

917. VOLKART, A., A. GRISCH, UND W. BANDI. **Zweiundvierzigster Jahresbericht der Samenuntersuchungs- und Versuchsanstalt Oerlikon-Zürich. [Forty-second annual report of the seed testing station at Oerlikon, Zurich.]** Landw. Jahrb. Schweiz 35: 67–89. *1 fig.* 1921.—A report of the seed-testing work for the year 1918–19 is presented, together with a summarized statement of the results of seed tests from 1876 to 1919. Information is also given regarding field tests with cereal and forage crops and the control of plant diseases.—*J. D. Luckett.*

918. WALDRON, L. R. **Winter wheat in North Dakota.** North Dakota Agric. Exp. Sta. Bull. 151. *8 p.* 1921.—The bulletin summarizes experiments with winter wheat conducted at 5 stations and upon several demonstration farms in North Dakota. Results have been almost uniformly negative although winter wheat has shown somewhat greater success at Dickinson and Williston, in the western portion of the state, than at Fargo, Langdon, or Edgeley, in the eastern portion. It will be necessary to secure hardier varieties if winter wheat is to be grown in North Dakota on a commercial scale.—*L. R. Waldron.*

919. WENHOLZ, H. **Nomenclature of maize varieties.** Agric. Gaz. New South Wales 32: 536. 1921.—The names Fitzroy and Wellingrove are applied to 2 established yellow dent varieties. Ulmarra White Cap, Large Red Hogan, and Manning Silvermine are applied to 3 varieties essentially new. Brief notes are given.—*L. R. Waldron.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Neil E. Stevens, *Editor*

(See also in this issue Entries 873, 943, 988, 1014, 1025, 1142, 1145, 1219, 1220, 1221, 1222, 1255, 1390)

920. Anonymous. **E. H. Wilson.** Florists' Exchange 50: 233. *Fig. 1.* 1920.—Mention is made of the departure of E. H. Wilson, assistant director of the Arnold Arboretum, Jamaica Plain, Massachusetts, for a 2-years' trip around the world to establish closer connections with the leading horticultural and botanical institutions.—*Lua A. Minns.*

921. Anonymous. **John Macoun memorial.** Canadian Field Nat. 34: 176. 1920—A memorial in the form of a painted portrait costing about $700 is to be hung in the Victoria Memorial Museum.—*W. H. Emig.*

922. Anonymous. **Summer field meeting of cereal pathologists.** Phytopathology 11: 177. 1921.—The plans and itinerary are announced for the summer meeting of cereal pathologists at University Farm, St. Paul, Minnesota, July 19–22, 1921.—*B. B. Higgins.*

923. Babcock, E. B. **Gregor Mendel and the support of scientific work at Brünn.** Science 54: 275–276. 1921.—This note includes a portion of a letter from Dr. Hugo Iltis at Brünn in which he announces the decision to sell the original manuscript of Mendel's Versuche über Pflanzenhybriden.—*C. J. Lyon.*

924. Campbell, D. H. **Professor H. Bruchmann.** Science 54: 67–68. 1921.—Bruchmann made remarkable studies on the life history of *Lycopodium*. He was born Nov. 13, 1847, and died Christmas day, 1920.—*C. J. Lyon.*

925. Fortún, G. M. **Notas sobre una excursión a "El Retiro." [Notes on an excursion to "El Retiro."]** Rev. Agric. Com. y Trab. [Cuba] 3: 410–413. *2 fig.* 1920.—A description is given of the ruins of the botanical garden of the late Cuban botanist José Blain, with mention of some trees growing there.—*F. M. Blodgett.*

926. Gothan, W. **J. T. Sterzel.** Zeitschr. Deutsch. Geol. Ges. 72: 138–140. 1920.—A brief account is given of this paleobotanist who died in 1914.—*E. W. Berry.*

927. Gupta, S. N. **The medicine and pharmacy of ancient India.** Pacific Pharm. 13: 64–70, 92–97. 1919.—The early history of India shows that the history of medicine is closely bound up with the social and religious customs of the people. Indian medical history is divided into 3 periods: Vedic, Brahmanic, and Arabian. Vedic, the earliest, is reflected in the 4 Vedas, and from the Rig-Veda and Atharva-Veda our knowledge of the theory and practice of Hindu medicine is derived. There was a materia medica limited to vegetable substances. In the later Vedic age there was separated from the priests a body of physicians who were at the same time apothecaries. In the Brahmanic period the Hindu system of medicine had become methodized, and arranged on a rational basis, with a scientific terminology. At least 6 standard works existed, and probably 2000 years later 2 names are pre-eminent, Charaka and Susruta, the former dealing with physiology and pathology, Susruta mostly with surgery. For 2000 years these books have been paid all the honors of a state recognized pharmacopoea. About 500 plants were named in Charaka, and 760 in Susruta. Physicians were required to study plants, and know where, when, and under what conditions to collect, dry, and preserve them. Toxicology was well developed, and the rajabs, as a means of self-protection, passed laws requiring that a newly discovered poison should not be made known until an antidote had been found.—*C. M. Sterling.*

928. Harshberger, J. W. **The old gardens of Pennsylvania. III-X.** Garden Mag. 32: 257–258, 326–328; 33: 44–46, 120–123, 195–196, 255–256, 326–329, 374–377. *Illus.* 1921.—The following places which are specially interesting for their old or rare trees are described, with

their history, and with notes and illustrations of many individual specimens: (3) Painter's arboretum, near Lima, Delaware county, a farm settled by Jacob Minshall in 1701, planted in trees from about 1825 by the brothers Minshall and Jacob Painter; (4) Peirce arboretum at Longwood, Chester county, where planting was begun about 1800 by Joshua and Samuel Peirce, on a tract patented by George Peirce or Pearce in 1700 or 1701; (5) Fairmount park in Philadelphia, which includes several historic places, among them the Lemon Hill estate of Robert Morris, and Belmont, the home of Judge Peters, where trees were planted by both Washington and Lafayette when guests; the black walnut planted by the latter is still standing, and there are many choice trees on Lansdowne Plateau, where the Michaux grove, which was to contain 2 specimens of every oak suited to the climate, was started in 1825 with money left by François André Michaux to the American Philosophical Society; (6) Woodlands Cemetery in Philadelphia, formerly the estate of William Hamilton, who had a fine collection of trees and shrubs as early as 1785; when Frederick Pursh was gardener there in 1802–1805, it was exceedingly rich in American species, with an immense collection of exotics, of which there remain 2 Ginkgos planted in 1785, probably the first in this country; (7) John Evans' arboretum in Radnor township, Delaware county, begun somewhat after 1828, when Evans first became interested in botany; he obtained rare and interesting plants by exchange from all over the world, and made several journeys in search of additions to his collection; (8) Awbury arboretum in Germantown, a plantation of trees begun about 60 years ago by Thomas P. Cope, and recently endowed as a public park by members of the Cope family; (9) Aldie, near Doylestown, where flower gardens and arboretum were begun about 1870 by the present owner's father, William Robert Mercer, Sr.; (10) Compton, near Philadelphia, less notable for age than for successful introduction of a great number of new Chinese and Japanese shrubs and plants, as well as those native to this country.—*H. C. Thompson.*

929. LINTON, A. W. **Pharmacy and medicine of George Eliot.** Western Druggist **43:** 78–80. 1921.—George Eliot was most thorough and painstaking in portraying her characters and spent an enormous amount of time in reading medical literature in preparation for her work, as is shown by several examples. The bitter rivalry between physicians and surgeons in Florence in the 15th century is illustrated by the conversation between the doctor and Nello the barber in Romola. The character of Dr. Lydgate in Middlemarch shows that she spared no pains to secure accuracy in every reference to professional matters, and was really in advance of her time. Sir James Paget declared that the insight of the author into medical life was so deep and accurate that he could hardly believe there was no biographical foundation for this character.—*C. M. Sterling.*

930. LYMAN, G. R. **Report of the twelfth annual meeting of the American Phytopathological Society.** Phytopathology **11:** 194–201. 1921.—The report contains the history of the meeting, together with the reports of the treasurer, of the business manager of Phytopathology, of the Advisory Board, of the committee on the Phytopathological Institute, of the committee on resolutions, and of the council.—*B. B. Higgins.*

931. MANGIN, LOUIS. **Emile Boudier (1828–1920).** Bull. Trimest. Soc. Mycol. France **36:** 181–188. *Portrait.* 1920.—A short biographical sketch of the great mycologist is given, followed by a list of his works, numbering 97.—*D. S. Welch.*

932. MATTIROLO, ORESTE. **Commemorazione del Corrisp. P. A. Saccardo. [Commemoration of P. A. Saccardo.]** Atti R. Accad. Lincei Roma Rendiconti (Cl. Sci. Fis. Mat. e Nat.) 30^1: 149–160. 1921.—An appreciation of the life and work of P. A. Saccardo is presented.—*F. M. Blodgett.*

933. MORSE, W. J. **A new Canadian agricultural journal.** Science **53:** 182–183. 1921.—Scientific Agriculture and La Revue Agronomique Canadienne, the official organ of the Canadian Society of Technical Agriculturists, is published monthly by the Industrial and Educational Publishing Co., Ltd., Gardenvale, Quebec. The 1st issue was dated Jan. 1, 1921. Articles are printed in both English and French.—*C. J. Lyon.*

934. Osterhout, W. J. V., Roland Thaxter, and M. L. Fernald. **Lincoln Ware Riddle.** Science 54: 9. 1921.—This is a minute on the life and services of Dr. Riddle taken from the records of the Faculty of Arts and Sciences of Harvard University.—*C. J. Lyon.*

935. Pirotta, Romualdo. **Commemorazione dell 'Accademico Prof. G. Cuboni. [Commemoration of Professor G. Cuboni.]** Atti R. Accad. Lincei Roma Rendiconti (Cl. Sci. Fis. Mat. e Nat.) 30[1]: 182–187. 1921.

936. Traverso, G. B. **Pier Andrea Saccardo.** Nuovo Gior. Bot. Ital. 27: 39–74. 1920 [1921].—An account is presented of the life and work of Saccardo (1845–1920), with a chronological list of his publications (p. 58–74) by his son, Domenico Saccardo.—*Ernst Artschwager.*

937. Wister, J. C. **What America has done for the Iris.** Gard. Mag. 33: 234–239. *13 fig.* 1921.—A brief history is given of the cultivation of Iris in America with mention of persons who have been instrumental in the development of Iris growing.—*H. C. Thompson.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Alfred Gundersen, *Assistant Editor*

(See also in this issue Entries 907, 1030, 1141, 1147, 1188, 1325)

938. Anonymous. **A botanical garden for the Pacific Coast.** Florists' Exchange 49: xvi. 1920.—The writer quotes and summarizes 2 letters describing La Quinta Ranch, at Sawtelle, near Santa Monica, California. The owner, Mr. Danziger, is desirous of so developing it that it shall be to the Pacific Coast what the Arnold Arboretum is to the Atlantic Coast. The estate consists of 1300 acres,—mountains and valleys, hills, and canyons, with winding drives that terminate at a height giving a view of Los Angeles, the Pacific, the Catalina Islands, and Mt. Baldy. The development has been under way for about 5 years under the supervision of Mr. P. D. Barnhart. The primary object will be to educate home-makers of this region in a knowledge of drouth-resistant exotics from similar climates. Vegetation will be gathered from all parts of the world and tried out in a small way.—*Lua A. Minns.*

939. Anonymous. **Educational forestry.** Science 54: 148–149. 1921.—Efforts to give some instruction to visitors are being made at the Alleghany State Park. "The Buffalo Academy of Science is coöperating with the New York State College of Forestry in this work." —*C. J. Lyon.*

940. Anonymous. **School children's maize growing competition at Yanco.** Agric. Gaz. New South Wales 32: 574. 1921.

941. Bowman, H. H. M. [Rev. of: Youngken, H. W. **Pharmaceutical botany.** *3rd ed., xix + 479 p., 238 illus., and glossary.* P. Blakiston's Son & Co.: Philadelphia, 1921.] Science 53: 189–190. 1921.

942. Chauvin, E. **A propos de récents empoisonnements par les champignons. [A propos of recent cases of mushroom-poisoning.]** Bull. Trimest. Soc. Mycol. France 36: 212–214. 1920. —Remarking upon 2 recently reported cases of fatal mushroom-poisoning, the author suggests methods for instructing the public in the identification of dangerous forms.—*D. S. Welch.*

943. Gleason, H. A. **The botanical gardens of New York.** Sci. Amer. Monthly 3: 24–26. *11 fig.* 1921.

944. Hayes, Herbert Kendall, and Ralph John Garber. **Breeding crop plants.** *xvii + 328 p., 66 fig.* McGraw Hill Book Co.: New York, 1921.—The 19 chapter headings are: Introduction (historical and fundamental), plant genetics, mode of reproduction in relation to breeding, field plot technic, controlling pollination, classification and inheritance in wheat, classification and inheritance for small grains other than wheat, methods of breeding small

grains, some results of selection with self-fertilized crops, some results of crossing as a means of improving self-fertilized crops; cowpeas, soy beans and velvet beans; flax and tobacco, cotton and sorghum, maize breeding; grasses, clover and alfalfa; potato improvement, breeding of vegetables, fruit breeding, farmers' methods of producing pure seeds. Five pages are devoted to definitions of technical terms, and 20 to literature citations.—*C. S. Gager.*

945. KENOYER, L. A. **Materials for nature study in India.** Indian Education **19**:441–444. 1921.—India has advantages over western countries (1) in richer variety of forest, field, and garden plants, (2) in better range of material throughout tbe year, (3) possibility of carrying on gardening during any or all the time that schools are in session. The monsoon season is the best, because at that time material is most abundant. Plants spring up in great numbers, dozens of species being discoverable in regions that, at other times, appear barren wastes. The school garden is recommended as a source of material for nature study. The pupils should learn that they do not need to depend on a *mali* to make plants grow. The author urges the founding in the hills or on the seashore of one or more summer laboratories for teachers and others. Most of the "botanies of the west" are unsuited to Indian schools because they treat of winter-deciduous trees, rings of growth, scaly buds, fleshy-rooted biennials as if they were typical, instead of specialized forms for enduring a special set of conditions.—*C. S. Gager.*

946. SCHWAPPACH, A., [and others]. **Neudammer Förster-Lehrbuch. [Neudamm forester's text-book.]** *6th ed., 940 p.* Neudamm, 1919.—A vast amount of information is grouped under the major headings: Botany, zoology, ecology, forest mensuration, silviculture, forest utilization, forest protection, forest organization, and hunting and fishing. The book is especially useful to forestry students.—*Richard H. D. Boerker.*

CYTOLOGY

GILBERT M. SMITH, *Editor*
GEORGE S. BRYAN, *Assistant Editor*

(See also in this issue Entries 1072, 1074, 1084, 1095, 1247)

947. GUILLIERMOND, A. **Nouvelles observations sur l'origine des plastides dans les phanérogames. [New observations on the origin of plastids in phanerogams.]** Rev. Gén. Bot. 33:401–419, 449–470. *Pl. 54–66, fig. 1–8.* 1921.—The author describes the origin of leucoplasts (amyloplastids) from their primordia in the tips of the roots of the gourd, *Ricinus*, bean, pea, *Zea Mays*, the bud of *Elodea canadensis*, the parts of the flower of *Iris germanica* and of *Tulipa suaveolens*. The term "condriome" is used as a general expression for all the granules, short rods, and longer slender rods in the cytoplasm that are usually known as mitochondria, chondrioconts, and chondriosomes. His description of the origin of leucoplasts from the primordia agrees in all essentials with that of other investigators who have traced the origin of plastids from their primordia. In all the objects studied Guilliermond acknowledges the fact already established by Rudolph, Saherer, Sapihin, and Mottier, namely, that besides the primordia of plastids in the cell, other similar granules and rods are present which do not become plastids. In the flower of the yellow varieties of *Tulipa suaveolens* the pigment, xanthophyll, is elaborated by mitochondria-like plastids. It is claimed that the chondriome content of the tissues above mentioned is similar to that of the cells in animals and in fungi.—*D. M. Mottier.*

ECOLOGY AND PLANT GEOGRAPHY

HENRY C. COWLES, *Editor*
GEORGE D. FULLER, *Assistant Editor*

(See also in this issue Entries 883, 901, 1194, 1198, 1200, 1202, 1227, 1249, 1352, 1385, 1415 1417, 1428)

GENERAL, FACTORS, MEASUREMENTS

948. ALLEN, WINFRED EMORY. **A quantitative and statistical study of the plankton of the San Joaquin River and its tributaries in and near Stockton, California, in 1893.** Univ. California

Publ. Zool. 22: 1–292. *Pl. 1–12, 1 fig.* 1920.—The present paper is an exhaustive study, including both the algae and the zooplankton, of the volumetric data, the times and conditions of occurrence, as well as the relation to various physical and physiographic features of the region surrounding the locality investigated. There is a very full presentation of data assembled during the investigation. The conclusions are as follows: (1) San Joaquin waters are capable of supporting abundant plankton, and they do so in the vicinity of Stockton; (2) the plankton of the sewage-laden Stockton Channel is distinctly different from that of the river, the number and volume of its animal forms being especially conspicuous as distinguished from the algal dominants of the latter; (3) temperature is, within certain limits, the determining factor in seasonal distribution. This may be by direct retardation of growth and reproduction in organisms, or by direct influenee through food supply and gaseous content of the water; (4) water currents above a moderate speed are distinctly inimical to plankton development; (5) the peculiar succession of rainy season and dry season has resulted in an autumnal maximum of plankton about Stockton, a condition directly contrary to that of vernal maxima recorded by other observers in other localities; (6) collections taken at intervals of 1 week or more do not furnish a basis for accurate determination of plankton distribution through the year. Daily collections properly taken would prohably do so; (7) there is some evidence in favor of the idea that increase of lunar light tends to increase of plankton, especially chlorophyll bearers; (8) there is evidence to show that fluctuations in amount of plankton occur at various hours of the day; (9) the abundant occurrence of *Bacillaria paradoxa*, generally listed as a typical brackish water form, is notable. This seems to be one case in which marked departure from a typical chemical environment has not visibly affected structure or behavior. The paper contains lists and notes on the species of the Bacteriaceae, Chlorophyceae, and chlorophyll-containing flagellates collected and studied.—*W. A. Setchell.*

949. Alps, H. F., and O. H. Hammonds. **Layer measurements of snow on ground near Summit, California.** Monthly Weather Rev. 48: 519–520. 1920.

950. Astre, Gaston. **Sur la biologie des mollusques dans les dunes maritimes françaises et ses rapports avec la géographie botanique. [On the biology of the molluscs of the maritime dunes of France and its relation to plant geography.]** Compt. Rend. Acad. Sci. Paris 171: 678–680. 1920.

951. Cannon, W. A. **Some characteristics of precipitation in arid regions.** [Abstract.] Ecology 1: 63. 1920.

952. Douglass, A. E. **Evidence of climatic effects in the annual rings of trees.** Ecology 1: 24–32. *10 fig.* 1920.—An attempt is made to correlate climatic effects with the size of tree rings. The main comparisons are made witb rainfall during the last 50 years. By means of a periodograph, the ring variations of Sequoias and yellow pines over large areas have been analyzed and found to have numerous corresponding periods or cycles of variability. Further analysis will be based upon a study of mean sensitivity, the difference between each 2 successive rings divided by their mean. This criterion is to be used in selecting materials for a study of past climates as integrated in the growth of tree rings.—*Charles A. Shull.*

953. Ferdinandsen, C. **Danske Ukrudtsformationer. [Danish formations of weeds.]** Nordisk Jordbrugsforskning [København] 1920: 49–67. 1920.—The present article is the author's abstract of his studies on the relations of weeds on cultivated mineral soils. Combining the statistical methods of Raunkiaer and the microbiological soil-testing methods of Cbristensen, the author details the weed spectra on alkaline and acid soils and gives lists of acidophile, acidokline, amphokline, basokline, and basopbile species. It is sbown that when cultivated ground is laid out as permanent grass tbe therophytes gradually are replaced by bemikryptophytes and chamaephytes.—*Ernst Gram.*

954. Ferdinandsen, C. **Traek af Skovhundssvampenes Biologi. [Fungi on forest ground.]** Meddel. Foren. Svampekundsk. Fremme [København] 1920: 69–82. *Fig. 1–2.* 1920.—

An account is given of the influence of moisture and light; also of growing habits and spore dissemination, with a list of species in the different localities.—*Ernst Gram.*

955. GRIGGS, R. F. **Scientific results of the Katmai Expeditions of the National Geographic Society. I-X.** Ohio State Univ. Bull. 24^{15}: 1–492. *126 fig.* 1920.—This is a collection of reprints from the Ohio Journal of Science. Among the papers included the following by the author are of botanical interest: The Recovery of Vegetation at Kodiak, Are the Ten Thousand Smokes real Volcanoes, The Character of the Eruption Indicated by its Effects on Nearby Vegetation, and The Beginnings of Revegetation in Katmai Valley.—*E. N. Transeau.*

956. KELLERMAN, KARL F. **The effects of salts of boron upon the distribution of desert vegetation.** Jour. Washington [D.C.] Acad. Sci. 10: 481–486. 1920.—The distribution of boron compounds in the water and soil of the Pacific Coast is discussed, and the suggestion made that there may be a very close relationship between the presence of these substances and the desert character of certain areas.—*Helen M. Gilkey.*

957. LESAGE, PIERRE. **Évaporomètres et mouvement des fluides au travers des membranes. [Evaporimeters and the movement of liquids through membranes.]** Compt. Rend. Acad. Sci. Paris 171: 927–930. 1920.—The author discusses the physical principles involved in the operation of evaporimeters and their relation to the movement of liquids through membranes. —*C. H. Farr.*

958. MOORE, BARRINGTON. **The scope of ecology.** Ecology 1: 3–5. 1920.—In this, the presidential address, delivered before the St. Louis meeting of the Ecological Society of America, 1919, the synthetic nature of the present problems in ecology is emphasized.—*Charles A. Shull.*

959. POWERS, EDWIN B. **The variation of the condition of seawater, especially the hydrogen-ion concentration, and its relation to marine organisms.** Publ. Puget Sound Biol. Sta. 2: 369–385. *Pl. 64.* 1920.—The work was done primarily with animals, but affects botany directly in the plankton and indirectly in general principles. It is suggested that the compatibility of the habitat depends more upon the per cent of hydrogen than upon any other water factor. Fixed forms must withstand a greater range of P_H than plankton or motile forms.—*T. C. Frye.*

960. SHREVE, EDITH B. **Seasonal changes in the water relations of desert plants.** [Abstract.] Ecology 1: 64. 1920.

961. VARNEY, B. M. **Monthly variations of the precipitation-altitude relation in the central Sierra Nevada of California.** Monthly Weather Rev. 48: 648. *2 fig.* 1920.—Study of the precipitation data for a series of stations across the central Sierra Nevada of California indicates that the rate of increase of precipitation with altitude varies throughout the year in a well-defined progression from smallest rate in summer to greatest in winter. Similarly, the rates of decrease in the zone above the level of maximum precipitation, and in the zone from the summit down the leeward slope are smallest in midsummer and greatest in midwinter.—It is suggested that the observed seasonal variations are probably the result of seasonal differences in the relative humidity of the air currents involved, and that, if this be true, well marked seasonal variations in the precipitation-altitude relation may be a general characteristic of regions having pronounced wet and dry seasons.—*Author's abstract.*

962. VARNEY, B. M. **Some further uses of the climograph.** Monthly Weather Rev. 48: 495–497. *Fig. 5.* 1920.

963. WEAVER, J. E., AND A. MOGENSEN. **Relative transpiration of coniferous and broad-leaved trees in autumn and winter.** Bot. Gaz. 68: 393–424. *18 fig.* 1919.—A series of greenhouse and field experiments, with results, are presented in tabulations and discussions. Based on the daily average water loss per unit area of leaf surface, the species rank as follows: *Abies*

grandis 5.44, *Quercus macrocarpa* 5.18, *Pinus Banksiana* 4.80, *Pinus ponderosa* 4.20, *Pic* *Engelmanni* 4.18, *Ulmus americana* 3.56, *Acer saccharinum* 2.66. Contrary to statements cor monly current, autumn transpiration losses in conifers are as great as, or greater than, tho from broad-leaved trees, and the decrease in water loss from broad-leaved trees due to def liation is paralleled by a similar decrease in conifers; winter losses from conifers are on $\frac{1}{55}$–$\frac{1}{261}$ as great as those in the autumn. Increased losses of broad-leaved trees in spri are in proportion to the leaf areas exposed and are closely controlled by weather condition conifers also show similar increased losses.—*H. C. Cowles.*

964. Weiss, H. B. **Coleoptera associated with Pleurotus ostreatus.** Entomol. Nev 31: 296–297. 1920.—This species seems more attractive than any other of the Agaricacea Twenty-six species of beetles are listed. Only a few species were found on *Pleurotus sapitu* Staphylinidae (rove-beetles) are commoner on gill fungi than on polypores.—*O. A. Stevens.*

965. Weiss, H. B. **The insect enemies of polyporoid fungi.** Amer. Nat. 54: 443–44 1920—A general plea is made that the species of fungi on which insects are collected be note The author calls attention to insect groups associated with polypores in New Jersey, 80 p cent of the species being infested by 59 species of Coleoptera, 5 of Hymenoptera (parasit on Coleoptera), 6 of Diptera, 3 of Lepidoptera, and 1 of Hemiptera. Certain polypores see more attractive to insects than others, the favorite being *Polyporus versicolor*.—*J. P. Kelly.*

966. Wherry, Edgar T. **Correlation between vegetation and soil acidity in southe New Jersey.** Proc. Acad. Nat. Sci. Philadelphia 72: 113–119. 1920.—The factors determi ing the character of the flora of the New Jersey Pinebarrens are held to be soil acidity and lo salt content.—*L. B. Walker.*

967. Wherry, Edgar T. **Observations on the soil acidity of Ericaceae and associate plants in the Middle Atlantic States.** Proc. Acad. Nat. Sci. Philadelphia 72: 84–111. 1920.- Tests of soils in the native habitats of 42 species of Ericaceae show very definite acid relatio ships. The optimum acid, frequently-observed acid, and occasional acid values of soils a given for each species. A similar table gives comparable results for the Orchidaceae.—*L. I Walker.*

968. Wherry, Edgar T. **Plant distribution around salt marshes in relation to soil acidit** Ecology 1: 42–48. 1920.—Evidence is presented to show that soil acidity is closely related t the distribution of native plants. The transition from low alkalinity in salt marches to hig acidity of soil surrounding these marches is sharp, the change occurring within the space of few centimeters. The acidity of soils around such marshes is explained on the basis of ac sorption of basic ions by clay and humus with liberation of acid, mainly hydrochloric an sulphuric. Lists of species are given occurring on circumneutral and acidic soils in Ne Jersey and at Oak Island near Boston.—*Charles A. Shull.*

969. Winters, S. R. **Measuring evaporation.** Sci. Amer. 124: 13. *1 fig.* 1921.—. brief description is given of an evaporimeter used by the U. S. Forest Service.—*Chas. I Otis.*

VEGETATION

970. Bolton, Edith. **Plant life in Cheddar caves.** Nature 106: 180. 1920.—The auth reports the identity of plants previously reported (Nature 105: 709. 1920). These are *Plagiothecium denticulatum*, *Amblystegium serpens*, and *Fissidens bryoides*; also a unicellula green alga, and a few fern prothallia. The spores were probably introduced on spades c on clothes of workmen, as previously suggested.—*O. A. Stevens.*

971. Cowles, H. C. **The rising rock shores of northern Lake Michigan.** [Abstract Ecology 1: 63. 1920.

972. Frye, T. C. **Plant migration along a partly drained lake.** Publ. Puget Sound Biol. Sta. 2: 393–397. 1920.—Shore plants migrate with the water level or perish when the level falls permanently. Erosion is a factor in keeping some submerged plants below a certain depth. It is doubtful whether floating seeds are a factor in determining shore plants, because the power to float is very general among plants not especially water-loving. The seeds of some thistles may roll on smooth water like tumble-weeds on a prairie.—*T. C. Frye.*

973. Fuller, George D. **An edaphic limit to forests in the prairie region of Illinois.** [Abstract.] Ecology 1: 64. 1920.

974. Hofmann, J. V. **The establishment of a Douglas fir forest.** Ecology 1: 49–53, 63. *1 fig.* 1920.—Production of heavy crops of seed, which are cached by rodents, retention of viability for long periods and through forest fires after burial, quick germination under favorable conditions, and rapid development of a long radix are the main factors leading to the establishment of Douglas fir as a stage in the forest development of the Cascade and Coast ranges. Its inability to endure shade eliminates it from the climax forest of the region.—*Charles A. Shull.*

975. Jassoy, A. **Die Pflanzenformationen der österreichischen Küstenländer in Lichtbildern. [The plant formations of the Austrian coast provinces.]** Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 47: 80–81. 1919.—A brief résumé is here given of an illustrated lecture on the vegetation of the countries bordering the Adriatic Sea. The presence of 2 rare and peculiar conifers, *Picea Omorica* and *Pinus Peuce,* is especially emphasized.—*A. W. Evans.*

976. Nichols, George E. **The vegetation of Connecticut. VII. The associations of depositing areas along the seacost.** Bull. Torrey Bot. Club 47: 511–548. *Fig. 1–10.* 1920.—Such areas are divided into 3 groups: (1) Stony bottoms and beaches, (2) sandy bottoms, beaches, and dunes, (3) muddy bottoms and shores and coastal swamps. In the 1st group are discussed the associations of the sublittoral, littoral, and supralittoral regions, including those of the shingle beaches. Under the 2nd are treated those of the same 3 regions, with a discussion of successional relations. Under the 3rd are discussed: (a) The associations of the salt marsh series, including muddy bottoms of sublittoral tidal flats, of lower littoral, the midlittoral marsh, and upper littoral marsh, and supralittoral region; also muddy beaches; (b) associations of brackish marsh series, with a somewhat similar series of divisions; and (c) associations of the fresh marsh series. Successional relations along depositing muddy shores are also treated.—*P. A. Munz.*

977. Setchell, W. A. **Stenothermy and zone-invasion.** Amer. Nat. 54: 385–397. 1920.—From the standpoint of distribution and effective reproduction, the author considers that stenothermy is the rule in marine plants. Stenothermy implies persistence normally between narrow temperature limits. The author recalls his previous division of surface waters of the ocean into zones according to courses of 10, 15, 20, and 25°C. isotheres and the fact that the majority of species are confined to one or another of these zones. Certain apparently exceptional (eurythermal) species are taken up, such as *Zostera marina,* which has effective methods of vegetative reproduction and dispersal, and *Ascophyllum nodosum* of the upper boreal zone, which appears as far south as New Jersey because there is sufficient seasonal duration below 10°C. for reproduction.—*James P. Kelly.*

978. Shull, C. A. **The formation of a new island in the Mississippi River.** [Abstract.] Ecology 1: 65. 1920.

FLORISTICS

979. Bews, J. W. **Some general principles of plant distribution as illustrated by the South African flora.** Ann. Botany 35: 1–36. 1921.—After a somewhat extended general discussion of some of the chief principles in plant distribution, the present-day conditions in South Africa are summarized. The climatic areas are arranged in order of increasing mesophytism

as follows: (1) Western, (2) Central Karroo, (3) Cape, (4) Sand-veld of the Kalahari, (5) Thorn-veld of the East, (6) High-veld and mountains of the East, (7) Coast belt of the East. In all these areas are habitats occupied by widespread species, such as cultivated land, streams, marshes, etc. Evidence is presented with numerous examples in favor of the following conclusions: (1) A widespread species coming in contact with conditions different from those which produced it may give rise to new species suited to the new conditions; (2) the new species in South Africa are usually more mesophytic than the parent but may be more xerophytic; (3) tropical species from the northern zone may give rise to temperate species; (4) one widespread species may give rise to several derived ones or may break up into several; (5) in many cases polygenesis is indicated by the fact that the same derived species may show a widely discontinuous distribution while the parent form is common over all the area. Some evidence is also given that the same conclusions apply to larger groups than species. The question of the origin of the South African flora is discussed and the conclusion is reached that it is probably of northern derivation.—*W. P. Thompson.*

980. Cratty, R. I. **Ranunculus Purshii in Iowa.** Rhodora 22: 183. 1920.—A new station is reported for this species in northern Iowa, thus extending the range several hundred miles southward in the Mississippi Valley.—*James P. Poole.*

981. Davy de Virville, Ad. **Note sur la distribution géographique comparée des Primula officinalis Jacq., Primula grandiflora Lam. et Primula elatior Jacq. dans l'ouest de la France. [On the geographical distribution of P. officinalis, P. grandiflora, and P. elatior in the west of France.]** Compt. Rend. Acad. Sci. Paris 170: 1068–1071. 1920.—The distribution of these 3 species in France is discussed.—*C. H. Farr.*

982. Gorman, M. W. **Flora of Hamilton Mountain, Washington.** Mazama 6: 62–77. 1920.—A list is given of 7 pteridophytes and about 190 spermatophytes, with localities. The mountain, 2,432 feet high, is in Skamania County, Southwestern Washington.—*T. C. Frye.*

983. Kaiser, George B. **Little journeys into mossland. I. Early bryological experiences.** Bryologist 23: 88–90. 1920.—An account is given of a day's botanizing near Philadelphia.—*E. B. Chamberlain.*

984. Long, Bayard. **A further note on Crepis biennis.** Rhodora 22: 192–193. 1920.—The discovery is reported of another authentic specimen of this species in addition to the 3 reported in a previous paper (see Bot. Absts. 4, Entry 347). This specimen, from the herbarium of Dr. Meredith, was collected from the lawn of the State Hospital at Danville, Pennsylvania, June 6, 1889, probably introduced in imported grass seed. The collector reports that it did not occur a 2nd year.—*James P. Poole.*

985. Moore, Barrington, C. C. Adams, T. L. Hankinson, G. P. Burns, and Norman Taylor. **Plants and animals of Mt. Marcy, New York.** [Abstract.] Ecology 1: 61. 1920.

986. Murrill, W. A. **Botanizing at Blacksburg, Virginia.** Jour. New York Bot. Gard. 21: 191–193. 1920.

987. Nelson, J. C. **Crepis setosa in Oregon.** Rhodora 22: 191–192. 1920.—The occurrence is noted of *C. capillaris* and *C. setosa* Haller f. in the Willamette Valley, both as introduced weeds. The absence of *C. biennis* in that region is further confirmed by the author.—*James P. Poole.*

988. Nelson, J. C. **Does Saximontanus mean "Rocky Mountains"?** Rhodora 22: 194–195. 1920.—The author calls attention to the fact that "saximontanus" is properly applied only to the part of the Rocky Mountain system from the Laramie Plains northward (the "Stony Mountains") and not to the southern Park Mountains, "saxa" meaning stone but detached fragments rather than bold cliffs and bare rocks, which would be described as "rupes" or "scopuli." Through general usage, however, the word has become applied to the whole Rocky Mountain system.—*James P. Poole.*

989. NELSON, J. C. **Notes on Scleropoa.** Torreya 20: 119–122. 1920.—*Scleropoa rigida* (L). Griseb., which was collected at Salem, Oregon in May, 1917, has been found each year since and seems to have thoroughly established itself. It has previously been known in the U. S. A. only from stations on, or very near, the coast of the eastern and southern states, with the exception of an accidental waif from South Dakota. The synonymy of the genus is briefly outlined.—*J. C. Nelson.*

990. NICHOLSON, WM. EDW. **Mosses from the Caspian and Black Sea regions.** Bryologist 23: 90–91. 1920.—A list is presented of 21 mosses and 2 hepatics, with notes on distribution.—*E. B. Chamberlain.*

991. OFFNER, JULES. **Remarques phytogéographiques sur les massifs du Vercors et du Dévoluy. [Remarks on the phytogeography of the massifs of Vercors and Dévoluy.]** Compt. Rend. Acad. Sci. Paris 169: 1054–1056. 1919.—A comparison is made of certain features of the plant geography of the alpine floras of the regions.—*V. H. Young.*

992. PARISH, S. B. **The immigrant plants of Southern California.** Bull. Southern California Acad. Sci. 19: 3–30. 1920.—The greater part of the paper is given over to an annotated catalogue of the established introduced species in Southern California; there are 281 species and varieties, 177 genera, and 41 families represented in the list. A bibliography of California immigrant species is given, their introduction being divided into the following historical periods: Mission, Pioneer, and Railway. The environmental conditions under which the species grow are discussed.—*Roxana Stinchfield Ferris.*

993. SAMUELSON, GUNNAR. **Mossor från Bergens skårgård. [Mosses from the islands near Bergen, Norway.]** Bergens Mus. Aarbok Naturv. Raekke 1917–18[16]: 23–25. 1920.—The list includes hepatics and mosses.—*A. Gundersen.*

994. SETCHELL, WILLIAM ALBERT. **Geographical distribution of the marine spermatophytes.** Bull. Torrey Bot. Club 47: 563–579. 1920.—The marine spermatophytes belong to the families Hydrocharitaceae and Potamogetonaceae, with a total of 8 genera and 34 or 35 species. These are plants all parts of which are subjected to the same conditions of temperature; they show the same temperature-zone relations as do the marine algae, most species being confined strictly to 1 temperature-zone, a few extending over 2 or more. Much additional information is needed to understand the factors concerned in the extensive distribution of some of these plants.—*P. A. Munz.*

995. WARD, H. A. **A new station for Gaylussacia brachycera.** Rhodora 22: 167–168. 1920.—A 3rd station for this species, near Losh's Run, Perry County, Pennslyvania, is reported. The colony covers the northern slope of a mountain ridge for fully a mile, averaging about 200 feet in width. The whole colony has apparently spread by root from a single plant. Later explorations on neighboring ridges brought to light 3 additional colonies, covering a large area and all confined to the northern slopes.—*James P. Poole.*

996. WOODWARD, R. W. **Panicum albemarlense in Connecticut.** Rhodora 22: 182. 1920.—A new station is reported for this species in Franklin, Connecticut.—*James P. Poole.*

997. YUNCKER, T. G. **A list of Indiana mosses.** Proc. Indiana Acad. Sci. 1920: 231–242. 1921.—The author has brought together all the available recorded and unrecorded lists of mosses for the state of Indiana. His report includes 174 species, 32 of which are listed from Indiana for the first time. Under each species data are given regarding stations and the names of collectors.—*F. C. Anderson.*

APPLIED ECOLOGY

998. JOHNSON, E. **Water hyacinth.** Monthly Bull. Dept. Agric. California 9: 77–80. 1920—The water hyacinth (*Eichhornia crassipes* Solms.), a native of tropical South America,

has been introduced into southern rivers of the U. S. A. It is now so abundant in Florida, Louisiana, and Texas as to obstruct navigation. The plant is quite sensitive to salt water but thrives in sub-saline water; it propagates by means of seed and runners. The most effective method of eradication is through spraying with a mixture of white arsenic and sal soda.—*E. L. Overholser.*

999. Pantanelli, E. **Coltivazione a Roma del Ghessab. (Pennisetum spicatum.) [Cultivation of Pennisetum spicatum in Rome.]** Staz. Sperim. Agrarie Ital. 53: 47–66. *Fig. 1–5.* 1920.—The present is a contribution to the study of plant adaptations, together with a botanical description of *Pennisetum* and a chemical study of the plant as regards total and protein nitrogen, fats, sugars, starch, hemicellulose, acidity, ash, and phosphorus. An extensive bibliography is appended.—*A. Bonazzi.*

1000. Sauvageau, C. **Sur des algues marines floridées indigènes pouvant fournir de la gélose. [On the indigenous marine algae capable of furnishing gelatin.]** Compt. Rend. Acad. Sci. Paris 171: 566–569. 1920.—The location is given of beds of gelatin-producing red algae on the coasts of France, Spain, other parts of the Mediterranean, and the extreme Orient. The species available are named and the method of extraction of the gelatin is described.—*C. H. Farr.*

1001. Waller, A. E. **The relation of plant succession to crop production.** Ohio State Univ. Bull. 25[9]: 7–74. *15 fig.* 1921.—Following an introduction dealing with the genetic classification of vegetation and the nature of crop ecology, the author presents a general discussion of plant successions and the climatic, edaphic, and biotic factors involved. The 2nd part of the paper treats of the factors influencing crop distribution in the U. S. A.; the importance of economic factors is emphasized. The 3rd part deals with the crop regions of Ohio and their significance. Attention is called to the correlation between the surface geology, natural vegetation, and the crop centers of the state.—*E. N. Transeau.*

1002. Weaver, J. E. **Correlation between the root development of cereals and grassland associations.** [Abstract.] Ecology 1: 65. 1920.

FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*

J. V. Hofmann, *Assistant Editor*

(See also in this issue Entries 928, 939, 967, 974, 1035, 1054, 1143, 1277, 1296, 1307, 1319, 1331, 1368, 1373, 1374, 1383, 1427)

1003. Anonymous. **Acacia bark as an industrial material.** Sci. Amer. Monthly 2: 340. 1920.

1004. Anonymous. **Forestry legislation.** Science 54: 188. 1921.—This article gives a few statistics, especially for the states of Pennsylvania, Minnesota, and California.—*C. J. Lyon.*

1005. Anonymous. **Report on the Botanical and Forestry Department (Hong Kong, China) for the year 1918.** *18 p.* [Received in the U. S. A. September, 1919.]—The report consists of a collection of short notes dealing with the administration of this department and is primarily of local interest. The notes deal with the activities of the department in connection with the botanical gardens and various grounds and nurseries in charge of the superintendent. The forestry activities include the formation of pine (species not mentioned) and broad-leaved (mainly *Tristania, Melaleuca,* and *Eucalyptus*) plantations, care of plantations, their protection from fire, the work of the forest guards, planting and care of roadside trees, repair of forest paths, clearing away undergrowth for anti-malarial purposes, and the granting of licenses and permits. Appended to the report are 6 tables and a supplement. The tables deal

with annual rainfall, a classification of offenses committed against the forestry laws and the police court results, a list of nurseries, and statement of revenue, including a table showing comparative revenue and expenditure; the total revenue amounts to only 12 per cent of the expenditures. The supplement enumerates a list of 10 additions to the flora of Hong Kong and adjacent territories. The report reveals the fact that this colony received almost 110 inches of rainfall during the year, of which about 90 fell during June, July, August, and September. Typhoon signals were hoisted twice during the year; considerable damage was done by these storms.—*Richard H. D. Boerker.*

1006. ANONYMOUS. **Report on the Botanical and Forestry Department (Hong Kong, China) for the year of 1919.** *17 p.* [Received in the U. S. A. October, 1920.]—The report consists of a collection of short notes dealing with the administration of this department and is primarily of local interest. The notes deal with the activities in connection with the botanical gardens and various grounds and nurseries in charge of the superintendent. The forestry activities include the formation of pine (species not given) and broad-leaved (*Eucalyptus Tristania,* and *Casuarina*) plantations, the care of such plantations, their protection from fire, the work of the forest guards, the planting and care of roadside trees, miscellaneous planting, the repair of roads and paths, the clearing of undergrowth for anti-malarial purposes, and the granting of forestry licenses and permits. To the report are appended 6 tables dealing with rainfall for the year, a classification of the offenses against the forestry laws and the police court results of these, the expenditures on the nurseries, the revenue derived from all sources, and the comparative revenue and expenditure for the entire year. The report discloses that the annual rainfall was about 90 inches, or slightly above normal. Typhoon signals were hoisted twice, the storms doing considerable damage. In 1919 the revenue amounted to 16 per cent of the expenditures, the highest revenue since 1913. Forestry licenses and timber sales furnish the bulk of the income. The total number of persons proceeded against for committing forestry offenses was 477; of this number 354 were convicted.—*Richard H. D. Boerker.*

1007. ANONYMOUS. **Research—an aid to forest perpetuation.** Sci. Amer. Monthly **2:** 360–363. *6 fig.* 1920.

1008. ANONYMOUS. **The mountain pride of Jamaica.** Sci. Amer. Monthly **2:** 332. *1 fig.* 1920.—*Spathelia simplex* is briefly described.—*Chas. H. Otis.*

1009. ANONYMOUS. **The Tongass national forest.** Science **54:** 166. 1921.—The Forest Service of the U. S. Department of Agriculture is selling timber for pulpwood from the forests of Alaska. Statistics on quantities, prices, and arrangements for mills are given.—*C. J. Lyon.*

1010. BEVAN, W. **Cultivation of osiers.** Cyprus Agric. Jour. **16:** 37–38. 1921.—The osier, *Salix viminalis,* is a deciduous plant including about 160 varieties. It is the material *par excellence* for basket making. Instructions are given as to its propagation, time and method of planting, and cultivation.—*W. Stuart.*

1011. BRUCE, DONALD. **A white fir volume table.** California Agric. Exp. Sta. Bull. 329. *41–45.* 1921.—The author has prepared a 3-part volume table for the determination of the average volume in board feet of trees of given diameters and heights. The "site" of any given tract is determined by estimating the average height of the tallest tenth of the merchantable trees. If this be over 9½ 16-foot logs, table 1 should be used; if 7½ or under, table 3; and for intermediate values, table 2. The table is based on trees measured (or estimated) outside the bark at 4½ feet from the ground, or on side-hill timber from average ground level. Trees to 8 inches diameter inside bark in top were scaled in 16-foot logs with 0.3 foot trimming allowance, by Scribner Decimal C rule. Table 1 was prepared after making 868 tree measurements, table 2 after 303, and table 3 after 206 tree measurements. As the table is based on trees measured as if sound, unbroken, and completely utilizable, it is essential that percentage reductions be made for rot, breakage, unused tops, and stumps. The cull percentage for white fir commonly ranges from 15 to 35, due mostly to rot and breakage.—*A. R. C. Haas.*

1012. Bühler, A. **Der Waldbau, nach wissenschaftlichen Forschung und praktischer Erfahrung. [Forest production based upon scientific investigation and practical experience.]** Vol. I. *662 p.* Stuttgart, 1918.—This is the first volume of a new book on silviculture and represents the life work of Dr. Bühler. Vol. I presents the natural and the economic factors of forest production, and Vol. II will present the practice of silviculture and the history of silvicultural practice and silvicultural science. Vol. I considers tree species, climatic factors, physiographic factors, soil factors, the silvical requirements of important tree species, and the economic factors of forest production. Under the latter are considered the value and price of forest land, price of labor, markets, the price of wood, and many other factors which affect the economic condition of forest owners. The work contains an abundance of tables.—*Richard H. D. Boerker.*

1013. Endres, Max. **Lehrbuch der Waldwertrechnung und Forststatik. [Forest valuation and forest statics.** *3rd enlarged ed. 324 p.* Berlin, 1919.

1014. Gayer, K. **Die Forstbenutzung. [Forest utilization.]** *11th ed., 642 p., 372 illus.* Berlin, 1919.—This edition was prepared by Ludwig Fabricius of the University of Munich; the 10th edition was prepared by Heinrich Mayr, of the same University, the 9th edition being the last prepared under the personal direction of Gayer, who died in 1907.—*Richard H. D. Boerker.*

1015. Geschwind. **Einige forstliche Wirtschaftsmethoden im herzegowinisch-dalmatinischen Karst. [Some methods of forest culture in the Herzegovinian and Dalmatian Karst.]** Wiener Allg. Forst- u. Jagdzeitg. **39:** 63–64, 72–73. 1921.—Several methods of forest culture peculiar to the southern Karst region are defined and named by the author. "Ograda" is a system under which an area of treeless land is enclosed by a rough wall ("orgrada," a Serbo-Croatian term, refers to wall as well as the area enclosed). Within 1–2 years a dense growth of broadleaf root sprout springs up which otherwise is suppressed by the heavy grazing common in the region. The sprouts are variously used as they reach suitable size; some finally yield merchantable timber. The stand develops into a selection coppice forest, previously described by the author (see Bot. Absts. 8, Entry 1850). In such forests grazing is a secondary consideration.—The "Trava" system is very similar, but in it grazing is the prime consideration. When the walled enclosure produces mostly shrubs or an incomplete cover broken by grassy openings, it becomes more valuable for grazing both in summer and winter (buds and twigs). Such an area, termed a "Trava," gradually develops into an inferior coppice forest; such forests are readily transformed from the "Trava" to the "Ograda" system of management and vice versa. Such variations from standard management are classed as "transition" systems. The "Zukva" method of forest culture is found especially in the coast region near the Gulf of Cattaro, where the Mediterranean broom or "zukva" (*Spartium junceum*) is cultivated upon calcareous soils for winter goat feed. These plants are grown from seed and protected for 4–5 years, after which they will endure grazing; 300 medium-sized bushes will winter 1 goat. The plant is very hardy and drouth resistant, and serves as an excellent nurse tree for *Pinus austriaca*, especially as it enriches the soil.—"Pelin" or "Kadulja" culture is not truly a system of forest culture. *Salvia officinalis*, "pelin" or "kadulja," often occupies overgrazed and denuded lands to the exclusion of other plants, growing into a bush with woody base. This plant is grazed sparingly by sheep and goats when other feed is scarce, but is not touched by cattle. Recently salvia leaves have been collected, dried, and exported for use in cosmetics and medicines. This extensive industry has many opponents because of its tendency to denude areas of even their cover of salvia, with disastrous results to the soil and watershed values. The author considers the practice harmless if leaves and tender tips only are collected in the latter part of the growing season. Season-long collecting and cutting down of bushes, on the other hand is harmful; moreover it interferes with honey production, salvia furnishing a large amount of bee pasturage.—*F. S. Baker.*

1016. Greely, W. B. **What should be our [U. S. A.] national forest policy.** Amer. Forestry **26:** 612–613, 617. 1920.—[Extracts from an extemporaneous address delivered at the reforestation conference of the wood-using industries held at Madison, Wisconsin, July 23, 1920.]

1017. KRESS, OTTO, SIDNEY D. WELLS, AND VANCE P. EDWARDES. **American pulpwoods.** Paper Indust. **1**: 362–369. 1919.—A description of 46 woods is given, including data on range, common names, weight, fiber length, and yield and other pulp characteristics.—*H. N. Lee.*

1018. KUBELKA, A. **Neuzeitliche Forstwirtschaft.** [**Modern forestry.**] Wiener Allg. Forst- u. Jagdzeitg. **39**: 93–94. 1921.—The author discusses the experiences and opinions of others in regard to the "continuous" system of forest management (Dauerwaldwirtschaft), as set forth in the author's book, Moderne Forstwirtschaft, and shorter articles in periodicals. The system is essentially natural and aims at continual maintenance of good forest cover, high yield per acre, and natural regeneration. It is the antithesis of clean cutting and planting systems, and denies the necessity of a set rotation and fixed annual fellings.—*F. S. Baker.*

1019. NECHLEBA, A. **Dritter Nonnenbrief aus Böhmen.** [**Third letter on the nun moth in Bohemia.**] Wiener Allg. Forst- u. Jagdzeitg. **39**: 106–107. 1921.—This letter deals chiefly with the results of experiments with chlorophosgene against the nun moth (*Liparis monacha*), as reported in Československý Lesník (Czechoslovenian Forester) no. 33, 1920. Sufficient gas was used to make a stream 60 m. wide and 200 m. long, carried on a gentle wind through a badly defoliated spruce stand. The strength was sufficient to kill a man in 3 minutes. Two hours' application had no other effect than temporarily paralysing large numbers of the male moths; other insects were also unharmed. The current year's growth of spruce was, however, killed. It appears that a special gas must be used which has a positive toxic effect on the moths and which is lighter than chlorophosgene, which fails to reach the treetops effectively. [See also following entry.]—*F. S. Baker.*

1020. NECHLEBA, A. **Zweiter Nonnenbrief aus Böhmen.** [**Second letter on the nun moth in Bohemia.**] Wiener Allg. Forst-u. Jagdzeitg. **39**: 86–87. 1921.—A general discussion is presented of the great increase in the nun moth (*Liparis monacha*) in Bohemia from 1917 to 1920, illustrated with maps showing the partly injured and entirely defoliated areas for each of the 4 years. [See also preceding entry.]—*F. S. Baker.*

1021. SECREST, EDMUND. **Forest planting in Ohio.** Monthly Bull. Ohio Agric. Exp. Sta. **6**: 51–58. 1921.—The necessary information desired by land owners who wish to establish woodlands and shelter belts by planting is briefly given. A limited number of species of forest trees are briefly evaluated. Reference is made to most desirable types for post timbers and a more extended discussion is given of conifers and evergreens. Care is taken to include mention of species which are not adapted for planting in Ohio.—*R. C. Thomas.*

1022. SHEPHERD, J. F. **Black-wattle bark for tanning.** New Zealand Jour. Agric. **21**: 267–269. 1920.

1023. SIMMONDS, J. H. **Private forestry.** New Zealand Jour. Agric. **21**: 271–282. *3 pl.* 1920.—The author describes the various species of forest trees planted 1870–1885. The most promising introduced trees are the conifers from western North America and the eucalyptus from Australia and New Zealand.—*N. J. Giddings.*

1024. TEICHMANN. **Ueber Lupinenanbau.** [**Lupine culture.**] Wiener Allg. Forst- u. Jagdzeitg. **39**: 100–101. 1921.—Clean cutting with complete utilization of litter in the region of Trpist, western Bohemia, raises an exceptionally difficult problem in forest planting. Under these circumstances the soil, derived from slate, bakes badly in summer and planted spruce trees grow poorly. (Southwestern slopes show best results, the litter being too scant to pay for removal and the soil is therefore noticeably lighter from the additional humus.) Weeds quickly claim such cut over lands and compete with the spruce. Plowing to kill the weeds and subsequent care to prevent reinvasion failed to improve the situation. Fertilizing with ammonium sulphate caused an immediate improvement the 1st year which, however, disappeared the 2nd. Sowing lupine seed rather lightly among the planted trees resulted in darker green needles within 2 years; within 6 years the results were excellent, height growth

in spruce amounting to as much as 40 cm. per year, whereas on the untreated areas it averaged hardly 1 cm. of poor, yellowish growth. Lupine flowers within 3 years and begins to reseed the area. Under these conditions there is little danger of choking the spruce. On areas recently cut over without removal of litter, development is much more rapid; large spruce stock must be used and some of the lupine plants too close to the spruce sometimes destroyed. On such sites seed should not be sown close to the spruce. Reference is made to an article by Frič on the same subject (Ceskoslovensky Lesnik Nos. 37–38) which discusses lupine culture under Růžička at Mülhausen.—*F. S. Baker.*

1025. Tschermak. **Die Forstverwaltungsbücherei. [The forester's book shelf.]** Wiener Allg. Forst- u. Jagdzeitg. **39**: 111–112. 1921.—This article consists of a list of standard (German) books on different phases of forestry and lumbering, with a short description of the character of each.—*F. S. Baker.*

1026. Valencia, F. V. **Mechanical test of some commerical Philippine timbers.** Philippine Jour. Sci. **18**: 485–533. *Pl. 1, fig. 1–19.* 1921.—This preliminary paper gives data collected by the Bureau of Science [P. I.] in cooperation with the Bureau of Forestry [P. I.], serving as a comparison of species as well as the establishment of working stresses. Tests were made of structural timbers and also of small specimens free from defects.—*Albert R. Sweetser.*

1027. Worliczek, C. **Betrachtung über die Erträgnisse der Staatsforste. [The yield of the state forests.]** Wiener Allg. Forst- u. Jagdzeitg. **39**: 105–106. 1921.—The statistics on the yield of the state forests of Austria from 1876 to 1920 are discussed showing some of the causes of variation. In general the production is showing a rising trend in relation to the total production of the country.—*F. S. Baker.*

GENETICS

George H. Shull, *Editor*
James P. Kelly, *Assistant Editor*

(See also in this issue Entries 872, 886, 910, 911, 916, 923, 1132, 1136, 1187, 1191, 1195, 1370, 1392)

1028. Anonymous. **An experimental determination of the probable error of Dr. Spearman's correlation coefficients.** Biometrika **13**: 263–282. 1921.—When the unit of grouping is small the product-moment method should be used, however small the sample. When one or both variables can be ranked but not scaled, Spearman's ρ is the natural method. In such cases it should be borne in mind that for small samples the mean, even of r_ρ, is lower than that of r, and the σ greater. It is not necessary to determine R and r_R in serious work.—*John Rice Miner.*

1029. Anonymous. **Hereditary trades.** Jour. Heredity **11**: 363. *1 fig.* 1920.—The custom is noted of Italian agricultural workers, especially those of the Roman Compagna, to specialize as families in the occupations of reapers, sowers, vine-trimmers, etc.—*Howard J. Banker.*

1030. Anonymous. **Meeting of geneticists interested in agriculture.** Jour. Heredity **11**: 384. 1920.—A brief account is given of a meeting held in Chicago, Dec. 28, 1921, attended largely by geneticists connected with the agricultural colleges and experiment stations of the U. S. A. A resolution was adopted favoring administratively independent departments of genetics to give the courses of instruction and direct the investigational work. It is believed this will help to simplify administration, prevent duplication, and give proper standing to the subject of genetics in the curriculum.—*Leon J. Cole.*

1031. Anonymous. **Moral qualities and eugenics.** Jour. Heredity **11**: 189. 1920.—A brief comment is made on the significance of mental and moral correlations suggested by the publication of the results of psychological tests in the American Army.—*Howard J. Banker.*

1032. ANONYMOUS. **The birth rate in mixed marriages.** Jour. Heredity 11: 96. 1920.—Review of an article by R. E. MAY in Zeitschr. Sexualwiss. April, 1919.—*Howard J. Banker.*

1033. ANONYMOUS. **The pollination of fruit blossoms.** Gard. Chron. 66: 278–279. 1919.—A list is given of fertile and self-sterile varieties of apples, pears, plums, and cherries. Varieties are listed which should be planted together.—*H. K. Hayes.*

1034. AUMIOT, J. **Expériences de rajeunissement et de perfectionnement de la pomme de terre. [Rejuvenation and improvement of the potato.]** Rev. Gén. Bot. 33: 183–189, 244–263. 1921.—In the section on bud variations the author states that particularly for *Solanum Commersonii* and *S. Maglia* heavy manuring and insolation are important in leading to the condition of non-equilibrium of the pre-mutation period. Many bud mutations are described, among them one of *S. Commersonii* that was productive and disease-resistant, and another from *S. Maglia* that was productive and drought-resistant. The greater part of the report deals with varietal hybrids ("métis") and specific hybrids ("hybrides"). The former are likely to show a preponderating male influence. Emphasis is laid on this "fundamental principle of regeneration and improvement"; the disease-resistance, productivity, vigor, etc., of a varietal hybrid may be superior to that of the better parent. The author refers to contagiousness of leptonecrosis and mosaic and to their not being transmitted by seed. Starting from seed is given as a method of eliminating such infections from stock.—*J. P. Kelly.*

1035. BALLY, W. **Selectie bij rubber en koffie. [Selection in rubber and coffee.]** Mededeel. Proefsta. Midden Java 33: *22 p.* 1920.—The most promising method for improvement in rubber is selection of good latex-producing and disease-resistant trees and subsequent propagation by budding. From present indications the most promising method in coffee is selection of healthy, productive (both in number and weight of fruit) trees and propagation from cuttings or self-fertilized seed.—*Helene Yampolsky.*

1036. BEHRENS. [German Rev. of: YAMAGUCHI, YASUKE. **Über die Beziehung der Aufblühzeit und des Sitzes der Blüte am Rispenaste zum korngewichte des Reises. (The relation of flowering time and the position of the flower on the inflorescence to seed weight in rice.)** Ber. Ohara Inst. Landw. Forsch. 1: 451–517. *35 fig.* 1919 (see Bot. Absts. 9, Entry 1386)]. *Zeitschr. Bot. 13: 603–604. 1921.*

1037. BISHOP, O. F., J. GRANTHAM, AND M. J. KNAPP. **Field experiments with Hevea.** [Rev. of: (1) BISHOP, O. F., J. GRANTHAM, AND M. D. KNAPP. **Probable error in field experimentation with Hevea.** Arch. Rubbercult. 1: 335–364. 1917. (2) GRANTHAM, J., AND M. D. KNAPP. **Field experimentation with Hevea brasiliensis.** Arch. Rubbercult. 2: 614–630. 1918 (see Bot. Absts. 10, Entry 1054). (3) MAAS, J. G. J. A. **Betrouwbaarheid van Veldproeven bij Hevea. (Reliability of field experiments with Hevea.)** Arch. Rubbercult. 2: 560–607. 1918 (see Bot. Absts. 10, Entry 1068)]. Agric. Bull. Federated Malay States 6: 596–597. 1918.

1038. BLAKESLEE, A. F. **Types of mutations and their possible significance in evolution.** Amer. Nat. 55: 254–267. 1921.—*Mutations of genes.*—Only 3 of these are known in *Datura Stramonium* after many years' observation by several workers. Experiments with *Portulaca grandiflora* confirm the view that these mutations may arise in somatic cells. *Changes in chromosome number.*—In 1 of the dozen or more Daturas with an extra chromosome, the progeny behave as if the gene for purple or white color were tripled, giving the expected ratios in the progeny of both heterozygotes, *Aaa* and *AAa*, after allowing for differential viability of pollen-cells and zygotes. In true tetraploid plants with twice the normal group of chromosomes, the purple-white gene is quadrupled, giving the expected ratios in the progeny of each of the 3 heterozygotes, *Aaaa*, *AAaa*, and *AAAa*. These genetic results, together with the observations on the chromosomes, afford a proof of the chromosome theory of heredity for flowering plants. Apparently the segregation of dwarf forms from the tetraploid form of *Oenothera Lamarckiana* in the cultures of de Vries occurred in the expected ratios, after allow-

ing for differential viability. It is suggested that the terms tetraploid and triploid might well be used, at least in the strict sense, only for plants which have in each set respectively 3 or 4 strictly homologous chromosomes.—In chromosomal duplication no new genes are added. The striking effects produced are due to the disturbance of the normal balance between all the genes of the diploid group of chromosomes. Thus triploid plants, where there is no special disturbance of this balance. are as yet only to be distinguished from normals by their pollen, and the same is the case with some tetraploids.—For the formation of new species from tetraploid plants it seems requisite that the 4 chromosomes of a set should cease to assort at random, and should pair only in separate sets of 2. Such double diploid plants would be distinguished by having duplicate genes, giving a 15:1 ratio when doubly heterozygous. The same would apply to plants with only 1 set of 4 chromosomes, and the rest in pairs.—*John Belling.*

1039. BLARINGHEM, L. **Recherches sur les hybrides du lin (Linum usitatissimum L.) [Studies on the hybrids of flax.]** Compt. Rend. Acad. Sci. **175**: 329–331. 1921.—Flax cultivated for seed is more homogeneous than flax cultivated for fiber. Crossing with white-seeded flax was used to study genetic constitution of the flax of Maroc, the crossing, however, being difficult and resulting in few plants. Brown color and ciliated walls of Maroc proved dominant over white color and naked walls in fruit of flax with white seeds. Maroc shows 2 lines, one acting as a carrier of simple Mendelian characters, the other of complex characters. Separation of lines by testing with known combination is the basis of technique in flax selection. —*Helen D. Hill.*

1040. BLARINGHEM, L. **Variation de la forme des feuilles, corrélatives de la sexualité, observées sur des génévriers (Juniperus chinensis L., J. phoenicia L.). [Variation of the form of the leaves correlative with sexuality observed in the junipers.]** Compt. Rend. Soc. Biol. **84**: 500–502. 1921.—The author examined a male plant of *J. chinensis* and a female plant of *J. phoenicia* for correlation between sporophylls and vegetative leaves. Below were branches with awl-shaped (juvenile) leaves and without cones; above were branches with scale leaves accompanied by cones. A few cases of cones among needle-shaped leaves remind the author of rare cases of paedogenesis, as in *Axolotl.*—*J. P. Kelly.*

1041. CLAUSSEN, P. [German Rev. of: BLAKESLEE, A. F. **Lindner's roll-tube method of separation cultures.** Phytopathology **5**: 68–69. *1 pl.* 1915.] Zeitschr. Bot. **13**: 597–598. 1921.

1042. COLLINS, J. L. **Reversion in composites.** Jour. Heredity **12**: 129–133. *Fig. 16–19.* 1921.—The paper describes and figures a teratological form of *Crepis capillaris* resulting from a cross between Dutch and Swedish strains. Normally the plant has a perfectly smooth and naked receptacle, but on one plant appeared foliaceous palea-like bracts subtending the achenes of every head; this is considered a possible reversion to a pre-composite state. The composite capitulum may be developed through the shortening of a spike, or from an umbel in which the pedicels have disappeared. In the former case, according to James Small, the receptacle might be expected to be conical instead of flat, and in the latter the plant would have lost the bracts subtending the inner pedicels in the pre-composite stage. The author holds that the proliferated *Crepis* head, and also a somewhat analogous one of *Hypochaeris*, which he figures, support the umbellate-origin hypothesis. It is further suggested that in the past the genetic factors involved in producing such structures as are described may have become separated and are rarely brought together in crossing. The case is then to be considered as resembling that of the white sweet-peas which on crossing give a purple, or the mutant types of *Drosophila* which when united produce flies of the wild, or typical, form.—*T. D. A. Cockerell.*

1043. COULTER, M. C. **Mutation.** [Rev. of: (1) BAUR, ERWIN. **Mutationen von Antirrhinum majus. (Mutations of Antirrhinum majus.)** Zeitschr. Indukt. Abstamm.-u. Vererb. **19**: 177–193. *10 fig.* 1918 (see Bot. Absts. 2, Entry 1198; 3, Entry 2183). (2) ZELENY, CHARLES. **The direction and frequency of mutation in a series of multiple allelomorphs.** Anat. Rec. **20**:

210–211. 1921 (see Bot. Absts. 8, Entry 353). (3) MULLER, H. J., AND E. ALTENBURG. **A study of the character and mode of origin of eighteen mutations in the X-chromosomes of Drosophila.** Anat. Rec. **20**: 213. 1921 (see Bot. Absts. 8, Entry 306). (4) BRIDGES, CALVIN B. **Vermilion-deficiency.** Jour. Gen. Physiol. **1**: 645–656. 1919 (see Bot. Absts. 3, Entry 981). (5) BLAKESLEE, ALBERT F., JOHN BELLING, AND M. E. FARNHAM. **Chromosomal duplication and Mendelian phenomena in Datura mutants.** Science **52**: 388–390. 1920 (see Bot. Absts. 7, Entry 858). (6) MULLER, H. J. **Genetic variability, twin hybrids and constant hybrids, in a case of balanced lethal factors.** Genetics **3**: 433–499. *1 fig.* 1918 (see Bot. Absts. 2, Entry 257). (7) VRIES, H. DE **Phylogenetische und gruppenweise Artbildung. (Phylogenetic and group-wise species formation.)** Flora 11, 12 (Festschr. E. Stahl): 208–226. 1918 (see Bot. Absts. 5, Entry 349).] Bot. Gaz. **72**: 178–182. 1921.

1044. CUNNINGHAM, C. C. **Study of the relation of the length of kernel to the yield of corn (Zea mays indentata).** Jour. Agric. Res. **21**: 427–438. *Pl. 80–87, 1 fig.* 1921.—Corn from ears with short, smooth, or dimpled kernels, from ears with kernels of maximum length with chaffy crowns, and from ears with kernels of medium length and wrinkled dented, were planted. Seed was continuously selected, smooth, rough, and medium ears being chosen each season from the progeny of smooth, rough, and medium ears, respectively. The 3 types made respective 4-year average yields of 36.5, 35.5, and 34.8 bushels per acre.—Continuous selection of smooth and rather short kernels for 4 generations increased the average length of ears, slightly decreased the weight, and decreased the circumference, number of rows per ear, length of kernel, and percentage of shelled grain; while continuous selection of rough and rather long kernels decreased the average length of ear and increased the circumference, but had no significant effect on the weight of ears, number of rows per ear, length of kernel, or percentage of grain.—*H. M. Steece.*

1045. CZAJA, A. TH. [German Rev. of: STEIL, W. N. **A study of apogamy in Nephrodium hirtipes Hk.** Ann. Botany **33**: 109–132. *3 pl.* 1919 (see Bot. Absts. 2, Entry 738).] Zeitschr. Bot. **13**: 599–601. 1921.—[See also Bot. Absts. 4, Entry 985.]

1046. DARROW, GEO. M. **Are our raspberries derived from American or European species?** Jour. Heredity **11**: 179–184. *4 fig.* 1920.—Because of the relative hardiness of the cultivated red raspberries in America as compared with the European species, pomologists have always considered them as representative of the pure native species *Rubus strigosus*. The author disagrees because of the observed differences in the cultivated varieties from both native and European species. For authority on the botanical characters of the pure native and the foreign species such names are cited as Rydberg, Card, and Foche. Tables are included with brief descriptive terms of 10 varieties of *R. strigosus*, 7 of *R. strigosus* × *R. occidentalis*, 16 of *R. Idaeus*, 9 of *R. Idaeus* × *R. strigosus*, and 3 of *R. Idaeus* × *R. occidentalis*. The derivation of the varieties mentioned in the tables was obtained (1) by an inspection of herbarium material supplemented where possible by observations of the varieties in the field; (2) by a study of the history of the variety in question. The author admits that some of these derivations may be questionable and for final analysis must be submitted to the more rigid tests of the plant breeder.—*L. R. Detjen.*

1047. DYKES, W. R. **Iris acutikor. (Iris acutiloba and I. Korolkowi.)** Gard. Chron. **70**: 5. 1921.—The author describes and figures a hybrid produced from *I. acutiloba* pollinated by *I. Korolkowi*, the hybrid showing characters of both parents; those that survived were both sturdier and more floriferous than either parent.—*J. Marion Shull.*

1048. EAST, E. M., AND D. F. JONES. **Round Tip tobacco. A plant "made to order."** Jour. Heredity **12**: 51–56. *Fig. 1–5.* 1921.—A popular description is presented of the desirable qualities of cigar wrapper leaf, the origin of the Round Tip type, together with the advantages of this type over others grown in the Connecticut Valley. Round Tip is the result of a cross between the Sumatra and Broadleaf varieties, and has been grown commerically sufficiently to indicate that it possesses great possibilities from the farmer's standpoint if the trade will accept the type on its own merits.—*J. Johnson.*

1049. Elderton, Ethel M. [Rev. of: **A study of women delinquents in New York State by Mabel R. Fernald, Mary H. S. Hayes and Almena Dawley with a statistical chapter by Beardsley Ruml and a preface by Katherine Bement Davis.** Century Co.: 1921.] Biometrika 13: 305–308. 1921.—This is said to be the first use of modern statistical methods in a study of women delinquents. Data are confined to mental capacity and main facts of personal and environmental history, as adequate physical and medical facts could not be obtained. The groups studied were: (1) New York State Reformatory women between ages of 16 and 30 convicted of felonies and misdemeanors; (2) Auburn State Prison felons; (3) Magdalen Home sex offenders; and (4) New York County Penitentiary; (5) workhouse, and (6) women's night-court cases. Inebriates are omitted because of inability to obtain accurate information from them, thus eliminating many mental defectives and introducing a serious source of error Variation in the length of period over which the subjects were examined is also a defect. Mental condition was ascertained by Binet Simon 1911, Yerkes Bridges Point Scale, Stanford Revision Binet, Wooley Series, Individual standard tests of ability, and Educational tests; and by social investigation of home, relatives, employers and other agencies in touch with offender. Some correlation was found between age and number of previous convictions. Foreign white women make up a smaller percentage in each institutional group than in the population as a whole. Offenses of the foreigners were more serious than those of the natives. A correlation of 0.31 was found between condition of home and age at first conviction. In 15.9 per cent of families some other member had been convicted of crime. No correlation was demonstrated between age upon leaving school and first conviction nor between number of convictions and grade reached in school. More domestic workers were included in the group than in the general population, and a lower standard of education prevailed than in other occupations. The younger women had reached a higher grade of education than the older. No correlation was found between earning capacity and number of convictions. Neither lack of education nor low and irregular wages are responsible for delinquency. No relation was seen between habitual use of alcohol, drugs, or cigarettes and intelligence. A correlation of 0.38 occurred between delinquency and intelligence. Also, significant correlations were found between mental capacity and type of occupation, between wage capacity and type of occupation, and between mental capacity and earning capacity.—No control series was used for comparison with normal population. Comparison with men criminals is futile because the offenses of male convicts are not comparable. The data are considered inadequate for treatment of hereditary aspects.—*Miriam C. Gould.*

1050. Fernald, M. L. **The geographic distribution of hybrids.** Science 54: 73–74. 1921.—Kerner is quoted on cases of assumed hybrids of *Nuphar*, *Salvia*, and *Rhododendron* which spread beyond the limits of the parent species and are then indistinguishable from true species. Similar cases were recorded by the writer in *Rubus*.—*T. D. A. Cockerell.*

1051. Fleischmann, Rudolf. **Beiträge zur Leinzüchtung. [Contributions to flax breeding.]** Zeitschr. Pflanzenzücht. 8: 26–43. 1921.—Certain results in practical fiber-flax breeding are detailed relative to variation, correlation, and inheritance of stem length. Breeding material was taken from fields in 2 districts of Hungary. Branched portion of flax plant showed greater variability than lower, unbranched, portion. The author concludes that clearer, more accurate results were obtained by limiting the study to unbranched part of stem. Intensity of inheritance was measured by coefficient of correlation of length of stem from one generation to next. This coefficient was generally high but varied according to weather conditions. (Two crops were raised each season.) Inheritance of stem length was as pronounced with selected lines as in general, unselected stock. In series of selected lines showing decrease in stem length, the standard deviation was found also to decrease coincident with approach to a symmetrical type of curve. Skewness decreased as mean length diminished; this did not hold true in mixed populations. Absolute decrease of stem length, brought about by weather conditions, was relatively greater in selected lines of maximum stem length; results of this character were less marked in unselected stocks. Hot, moist weather in 2nd half of 1920 decidedly increased the coefficient of variation. Stem length was not significantly increased, but flowers and bolls were markedly increased and also basal branches. Selection of stem length within (presumably) pure lines showed no significant influence.—*L. R. Waldron.*

1052. FORBES, A. W. **Education and the size of families.** Jour. Heredity 12: 190–191. 1921.—The author advances an economic theory in explanation of the small families among college graduates and other educated people. The colleges increase the income of older people, but decrease the income of young people. The standard of living depends largely on the income of the parents. "The condition most favorable to large families is an income of the sons equal to that of the parents at as early an age as possible. At present this condition is met among those of inferior parents. . . . . . . It is farthest from being true among those with the best inheritance, and the colleges are largely responsible for the condition."—*Howard J. Banker.*

1053. GOETZ, E. **Tabakanbauversuche. [Tobacco culture investigations.]** Badisches Wochenbl. 1919: 67–69. 1919.—The yield of pure lines of tobacco is compared with that of the F_1 hybrids of the lines. The mean of parental lines is usually lower than that of F_1 hybrids. In some cases the F_1 exceeded that of the higher-yielding parent. [From anonymous Abstract in Zeitschr. Pflanzenzücht. 7: 35. 1919.]—*J. P. Kelly.*

1054. GRANTHAM, J., AND M. D. KNAPP. **Field experimentation with Hevea brasiliensis.** Arch. Rubbercultuur 2: 614–630. 1918.—Yields are given from a large number of individual trees for a period of 12 months. From these data conclusions are drawn concerning the probable error which must be applied in interpreting results of field trials. The error calculated on a tree basis is lower than that calculated on an area basis. The error is not reduced by continuing the experiment longer than 6 months. The use of square plots is advised. No increase in accuracy results from using a plot of more than 100 trees. The theoretical reduction of error by duplication of plots is secured up to the 8 duplications made in the experiment. More than 10 or 15 duplications are generally inadvisable. A probable error of 6 per cent may be used for 100 tree plots. A precision of less than 5 per cent is not considered practical. [See also Bot. Absts. 10, Entry 1037.]—*Carl D. La Rue.*

1055. HARLIN, RALPH G. **A case of inherited syndactyly in man.** Jour. Heredity 11: 334–335. *1 fig.* 1920.—A type of syndactyly taking the form of a partial webbing between the 2nd and 3rd toes occurs in a man, his only son, and 3 of the son's 6 children. The subjects are members "of an old New England family whose genealogy has been fully investigated and published." Despite the fact that this man was one of 10 children, and his presumably normal father one of 6, the trait does not occur in any of the collateral lines. Since the degree to which the trait is manifested is variable the author suggests that it may often pass unnoticed. —*C. H. Danforth.*

1056. HARRIS, J. ARTHUR, WM. F. KIRKPATRICK, A. F. BLAKESLEE, D. E. WARNER, AND L. E. CARD. **The egg records of limited periods as criteria for predicting the egg production of the white leghorn fowl.** Genetics 6: 265–309. *10 diagrams.* 1921.—By mathematical formulae derived from the egg records of hens entered at the Storrs Contest 1911–1917, the authors were able to predict with fair accuracy the annual egg record of any hen in the contest when the record for 1 month was known. A 2-month record gave slightly greater accuracy to the prediction. The formulae could also be used on whole flocks of the same breed, but longer periods gave more decided improvement in the accuracy of the predictions. In either case the hens were kept under essentially the same conditions throughout the time the tests were carried out.—*H. G. May.*

1057. HENDRICKSON, A. H. **Inter species pollination of plums.** Proc. Amer. Soc. Hort. Sci. 16: 50–52. 1919 [1920].—The varieties used were Burbank (*Prunus triflora*), Reine Claude (*P. domestica*), German Prune (*P. domestica*), and Shropshire (*P. insititia*). Results at the second examination, June 12, were as follows: In Burbank, 2281 open-pollinated flowers set 1.2 per cent; 150 flowers selfed set 0.0 per cent; 316 flowers × Reine Claude set 5.4 per cent. In Reine Claude, 3505 open-pollinated flowers set 7.1 per cent; 312 flowers selfed set 12.8 per cent; 322 flowers × Burbank set 0.6 per cent; 488 flowers × German Prune set 13.8 per cent. In German Prune, 3496 open-pollinated flowers set 20.0 per cent; 426 flowers selfed set 0.0

per cent; 396 flowers × Shropshire set 29.6 per cent; 354 flowers × Reine Claude set 47.4 per cent. In Shropshire, 3591 open-pollinated flowers set 5.8 per cent; 599 flowers selfed set 2.0 per cent; 433 flowers × German Prune set 13.6 per cent; 381 flowers × Reine Claude set 12.0 per cent. Inter-species crosses between *P. triflora* and *P. domestica* and between *P. domestica* and *P. insititia* are fertile.—*C. S. Crandall.*

1058. JACOB, JOSEPH. **Tulip thieves.** Gard. Chron. 69: 299. 1921.—The author refers to an item by E. H. Krelage, published in 1881, concerning an occasional form of atavism in which tulips return to a form with narrow petals, mostly of one color,—a pale mauve pink. He adds to these "thieves" another form in which, instead of blooming, the bulb produces but one big leaf and later many small bulblets, which continue to behave in the same manner and, if not rogued out, presently dominate and produce a deteriorated stock.—*J. Marion Shull.*

1059. JONES, SARAH V. H. **Inheritance of silkiness in fowls.** Jour. Heredity 12: 117–128. *Fig. 9–15.* 1921.—The author reviews the literature on several silky breeds of fowls and shows that the sporadic appearance of silky-feathered individuals in flocks of normally-feathered fowls is not rare. Previous work on the genetics of silkiness is summarized and data covering the genetic constitution of a sporadic silky individual are presented which show that it is genetically identical, so far as feather structure is concerned, with the common Japanese silky breed.—*W. A. Lippincott.*

1060. KEMPTON, J. H. **Heritable characters of maize. V. Adherence.** Jour. Heredity 11: 317–322. *Fig. 16–19.* 1921.—Adherence is a variation in which the leaves, bracts, and inflorescences coalesce. In some cases this abnormality is apparent in the seedling stage, but such plants usually recover and grow normally until the ear-bearing node is reached, when adherence again appears. Because of the coalescence of the upper leaves and tassel the latter is exserted with difficulty. The tassel branches cling together to form a solid structure so that pollen is shed only from the spikelets of the lower and outer branches. This abnormality is apparently due to a single Mendelian factor and can very readily be eliminated.—*W. H. Eyster.*

1061. LAMON, HARRY M. **Lamona—a new breed of poultry.** Jour. Heredity 12: 3–29. *Frontispiece, fig. 1–26.* 1921.—The author attempted to establish a new breed of fowls combining the characters of the egg and meat types, and laying white eggs. White Plymouth Rocks and White Leghorns were used, the former as a general utility bird and the latter as the egg type, used also to introduce the white egg character. The Silver Gray Dorking was used to introduce good meat qualities and the long, rectangular body. The object was "to produce a breed of fowls of two varieties (single and rose comb) having the shape, size, and market qualities of the Dorking with a yellow skin, white plumage, and four toes, and that will lay a large, white egg." The project, begun in the spring of 1912, has been carried through several generations and the single-comb variety has been fairly well established.—*H. G. May.*

1062. LAUGHLIN, HARRY H. **Race assimilation by the pure-sire method.** Jour. Heredity 11: 259–263. *4 fig.* 1920.—The greater potency of the pure-sire method over the pure-dam method in race assimilation is demonstrated from both physiological and social considerations. The latter are dwelt upon at considerable length and illustrated with pedigree charts from early Spanish-American sources, from a hypothetical case in Ibanez's "The Four Horsemen of the Apocalypse", from a Jamaican Jewish-Negro family, and from a Jamaican Hindu-Negro family. The writer concludes, "whenever 2 races come into intimate contact the upper race tends to remain pure while the lower tends toward assimilation into the upper by the pure-sire system."—*Howard J. Banker.*

1063. LILIENFELD, F. **Die Resultate einiger Bestäubungen mit verschiedenaltrigem Pollen Cannabis sativa.** [Results of pollinations of Cannabis sativa with pollen of different ages.] Biol. Zentralbl. 41: 295–303. 1921.—The author tested the claims of Ciesielski

that hemp pollinated with fresh pollen produces a great preponderance of staminate plants while pollination with old pollen (12 hours old) gives a preponderance of carpellate plants. Ciesielski's results were not substantiated as the author obtained an average of 37.77 per cent staminate and 62.27 per cent carpellate plants with fresh pollen and 38.55 per cent staminate and 61.45 per cent carpellate plants with pollen 12 hours old. With pollen 30 hours old 45.14 per cent staminate and 54.86 per cent carpellate plants were obtained, while pollen 36 hours old gave 40.25 per cent staminate and 59.75 per cent carpellate plants. These numbers all come within the natural fluctuation of the sex ratio of hemp. The author thinks the progressive increase in the proportion of staminate to carpellate plants with increased age of the pollen might be due to a difference in the vitality of male- and female-determining pollen grains resulting in elimination of the weaker group.—*John H. Schaffner.*

1064. LINDSTROM, E. W. **Chlorophyll factors of maize.** Jour. Heredity 11: 269–277. *3 fig.* 1920.—Factors responsible for chlorophyll deficiencies which decrease or limit the productivity of maize are apparently present in a number of different chromosomes. The elimination of such chlorophyll deficiencies by inbreeding will result in the loss of the favorable growth factors located in the same chromosomes. For this reason material relatively free of abnormalities should be chosen for inbreeding, and it is probable there would be very little loss of stature, yield, or fertility.—*W. H. Eyster.*

1065. LIPPINCOTT, WILLIAM A. **A hen which changed color.** Jour. Heredity 11: 342–348. *Fig. 1–7.* 1920.—This is an account of a pedigreed Blue Andalusian hen which gradually became pure white through replacement, at successive annual molts, of colored feathers by white ones. The bird was bred and shown by several tests to have retained her original genetic constitution.—*H. D. Goodale.*

1066. LOMEN, G. J. **The reindeer industry in Alaska.** Jour. Heredity 11: 243–252. *Frontispiece, 10 fig.* 1920.—The reindeer's characteristics and habits are briefly described, and the significance of the antlers is discussed. Small antlers are considered a sign of deterioration while straight antlers are believed to indicate sterility. The doe gives birth to 1 (rarely 2) fawn annually. The period of gestation is 7 months and 7 days, and the does continue to breed until 14 or 15 years of age. There is necessity for improvement due to inbreeding of the Siberian stocks first imported, and to the possible use of the caribou as a source of improvement.—*Edward N. Wentworth.*

1067. LUSH, JAY L. **Inheritance in swine.** Jour. Heredity 12: 57–71. *Fig. 6–19.* 1921. —The author reports on the data accumulated in a series of experiments conducted at the Kansas Agricultural Experiment Station. These experiments, interrupted by the war, ended with the F_1 and F_2 generation. To study litter size the wild boar, which normally produces 4 pigs at a birth, was crossed to the Tamworth, which normally produces about 11 pigs. One F_1 sow produced 4 pigs indicating a dominance of wild litter size. Inter-crosses of Berkshires, Tamworths, Duroc-Jerseys, and wild indicated that the erect carriage of ear is dominant, although dependent on more than 1, but less than 3, factors. Sharp dish of face and short face proved dominant to other classes. The production of bright pigment was found to be dependent on a single factor difference, while the differences between red, white, and sandy were shown to be due to 2 factors, either one of which in the absence of the other probably produces sandy, while one intensified the other to produce red; absence of both causes white. Comparison of growth curves in F_1 and F_2 generations is significant only in so far as it indicates increased variability for the F_2 generations, the average difference in the coefficients of variability at ages 1–13 months being about 6 per cent.—*Edward N. Wentworth.*

1068. MAAS, J. G. J. A. **Betrouwbaarheid van veldproeven bij Hevea. [Reliability of field experiments with Hevea.]** Arch. Rubbercultuur 2: 560–607. 1918.—The application of statistical methods to data from field experiments with Para rubber is discussed. The principal factors which cause variability are given, and the extent to which these factors may be controlled by the experimenter is considered. The writer believes the standard deviation to

be a more reliable measure of variation than the probable error where only a small number of plots is used. Data from 2 extensive experiments are given. The necessity of making preliminary experiments before planning extensive trials is pointed out, and the need of care in the choice of experimental plots is emphasized. [See also Bot. Absts. 10, Entry 1037.]—*Carl D. La Rue.*

1069. March, Lucien. **La méthode statistique. [The statistical method.]** Metron **1**: 22–52. 1920.—The aim of science is the classification of observations. The experimental method studies the relation of an effect to a single cause when other causes are held constant. When the various causes can not be isolated the statistical method must be used. Analysis of this method may be divided into 3 parts: (1) Comparison of centering constants; (2) study of variability within the group; (3) study of relationships between groups. Properties of the median and arithmetical mean are discussed.—*John Rice Miner.*

1070. Marshall, Roy E. **Report of three years' results in plum pollination in Oregon.** Proc. Amer. Soc. Hort. Sci. **16**: 42–49. *2 pl.* 1919 [1920].—See Bot. Absts. 6, Entry 129.

1071. Mellon, Ralph R. **The life-cycle changes of the so-called Corynebacterium Hodgkini, and their relation to the mutation changes in this species. Fourth paper on diphtherioids.** Jour. Med. Res. **42**: 61–76. 1920.—The strain of *C. Hodgkini* used, when cultivated under ordinary conditions, is generally non-granular. It infrequently develops "giant cocci," which respond to the stimulus of new environment; e.g., when cultured in broth plus rabbit serum they give rise to coccoid forms of irregular size, which continue development, with increase of chromatin, when 1 per cent maltose is added to this medium. Whether this process is degenerative or vitalistic is seen in the stabilization of the offspring obtained by the different modes of reproduction, viz., gemmation and sporulation (?); gemmation produced 3 generations unchanged. Response to environment is further emphasized by the fact that granular coccoid forms develop in serum broth but do not develop in hydrocele fluid. Arrested bacillary growth favors coccoid formation, a phenomenon which is constant.—The staining of chromatin and achromatic areas of the organism follows laws analogous to chemical reversibility and tautomerism.—The morphologic mutation effected by rotation seems to be of a cyclic character; however a return of the coccoid to the bacillary form has not been determined.—*Andrew I. Dawson.*

1072. Mol, W. E. de. **Over het voorkomen van heteroploide varieteiten van Hyacinthus orientalis L. in de Hollandsche kulturen. [On the occurrence of heteroploid varieties of Hyacinthus orientalis in Dutch cultures.]** Genetics **3**: 97–192. 1921.—The named hyacinth clones in which the somatic numbers of chromosomes were counted may be classed as follows:

Number of somatic chromosomes	Number of different clones	Number of chromosomes of the different sizes		
		Short	Medium	Long
16 (diploid)	19	4	4	8
19	1	4	6	9
20	1	5	5	10
21	1	5	6	10
22	1	5	6	11
23	1	5	5	13
24 (triploid)	4 (or 5)	6	6	12
27	2	7	8	12
		8	8	11
28	2	7	6	15
30	1	7	8	15

—*John Belling.*

1073. MOORE, CARL R. **On the physiological properties of the gonads as controllers of somatic and psychical characteristics. IV. Gonad transplantation in the guinea-pig.** Jour. Exp. Zoöl. 33: 355–389. *4 fig.* 1921.—This is a continuation of the author's previous work. Ovarian grafts in castrated male guinea-pigs lead to an hypertrophy of the teats, but no hyacquisition of female instincts occurs. Testicular grafts in spayed females produces hypertrophy of the clitoris, and male behavior. These results differ somewhat from those obtained with rats.—*H. D. Goodale.*

1074. OKKELBERG, PETER. **The early history of the germ cells in the brook lamprey, Entosphenus wilderi (Gage), up to and including the period of sex differentiation.** Jour. Morphol. 35: 1–151. *12 pl., 4 fig.* 1921.—This species shows juvenile hermaphroditism, with males and females in approximately equal numbers in the adult condition. This indication that sex is not irrevocably determined at time of fertilization and the lack of a complete account of germ-cell cycle for any vertebrate accounts for this work. Primordial germ cells are first recognized (by their size, structure, and position) when the mesoderm begins to separate from the entoderm before germ layers are definitely established (embryo about 191 hours old). They lie laterally in the posterior region of the mesentoderm, later through shifting of surrounding tissue and independent migration they come to a median position. The number is small (36 were found in one larva). They are the sole source of definitive germ cells in both sexes and never give rise to somatic tissues. From time of segregation up to 20 mm. stage of the embryo (about 4 months) these cells do not divide. From 20 to 35 mm. an indefinite number of divisions occur. Larvae up to this time are indifferent as to sex. From 35 to 70 mm. they become hermaphroditic as judged by the production in all gonads of large yolk-laden cells, which are considered as egg cells. A series of gonads gives from 0 to 100 per cent of these large cells. Reproductive organs (gonads and accessory structures) are simple and morphologically quite similar in adults of both sexes. This may be related to tendency of species towards juvenile hermaphroditism. The author concludes: First sexual changes appear in gonad, each of which contains 2 kinds of cells, those with tendency for rapid division (katabolic) and those with tendency for growth (anabolic). Difference is considered to be due to disturbance of metabolism of cells during mitoses or to environmental conditions. Relative proportions of anabolic and katabolic cells determine whether larva becomes male or female; therefore, sex is not irrevocably fixed at fertilization. The author grants that sex is ordinarily an hereditary character associated with sex chromosomes but holds them to be only one link in series of processes which determine sex, so that in a form like the lamprey with very little difference between sexes other factors may overcome the effects of the sex chromosomes; from this he infers that other hereditary characters may also be modifiable and points out that should such prove true there would be less objection to the idea that sex character may be modified. Secondary sex characters are probably not genetic but due to hormone action. In addition, the paper contains an account of habits and life history, list of important contributors to various theories of origin of germ cells in vertebrates with conclusions of each, and an unusually full discussion of literature bearing on subjects of hermaphroditism and sex-determination.—*E. Eleanor Carothers.*

1075. PINOY, P. E. **Sur la germination des spores, sur la nutrition, et sur la sexualité chez les Myxomycètes. [Germination of spores, nutrition, and sexuality in the Myxomycetes.]** Compt. Rend. Acad. Sci. Paris 173: 50–51. 1921.—The author replies to investigators who have opposed his conclusions regarding the Myxomycetes, and restates his theory, which holds that sexuality in the slime molds consists in the union of individual (+) and (–) myxamoebae to form plasmodia capable of fruiting.—*A. F. Blakeslee.*

1076. PLAHN, APP. **Die Bestimmung der Bruchfestigkeit der Getreidehalme. [The determination of brittleness of cereal culms.]** Deutsch. Landw. Presse 1920.—This article deals with the tests for load of single stems and sections of stems recommended by Kraus and Holdefleis, and brings investigational methods into a definite system. [From author's abstract in Zeitschr. Pflanzenzücht. 8: 63. 1921.]—*J. P. Kelly.*

1077. Popenoe, Paul. [Rev. of: Gager, C. Stuart. **Heredity and evolution in plants.** *14 × 20 cm., xi + 265 p., 113 fig.* P. Blakiston's Son & Co.: Philadelphia, 1920 (see Bot. Absts. 6, Entry 1672; 7, Entries 178, 1610; 8, Entry 1079).] Jour. Heredity **12**: 198. 1921.

1078. Popenoe, Paul. **Measuring human intelligence.** [Rev. of: Goddard, Henry Herbert. **Human efficiency and levels of intelligence.** *128 p.* Princeton Univ. Press: Princeton, 1920.] Jour. Heredity **12**: 231–236. 1921.

1079. Popenoe, Paul. [Rev. of: Stoddard, Lothrop. **The rising tide of color.** *320 p., 3 maps.* Charles Scribner's Sons: New York City, 1920.] Jour. Heredity **12**: 204. 1921.

1080. Popenoe, Wilson. **The Colombian berry or giant berry of Colombia.** Jour. Heredity **11**: 195–203. *Frontispiece, 4 fig.* 1920.—In 1914 the giant blackberry of Colombia was introduced into the U. S. A. from El Peñon, Colombia. In 1920 the author studied the species in its native habitat, and concluded that the Colombian berry is probably closely related to *Rubus roseus*, and best adapted to the southern and western (U. S. A.) states. Though fair to good in quality, the berry will probably prove most useful for work in hybridization because of its great size, the berries often measuring 2.5 × 1.5 inches. It is suggested that the name be changed from "giant blackberry of Colombia" to "Colombian berry." The fruit, plant and cultural requirements are described. David Fairchild appends a note referring to accounts of the berry by the explorers in Col. Roosevelt's expedition to South America in 1914.—*L. R. Detjen.*

1081. Roberts, Elmer. **Polydactylism in cattle.** Jour. Heredity **12**: 84–86. *6 fig.* 1921. —Three generations of polydactylism in cattle are reported, the abnormality appearing to behave as a dominant Mendelian unit.—*Sewall Wright.*

1082. Safford, W. E. **Datura—an inviting genus for the study of heredity.** Jour. Heredity **12**: 178–190. *Fig. 10–16.* 1921.—Species and varieties in the genus *Datura* are distinguished, and the probable origin of several forms and their use as narcotics, poisons, and aphrodisiacs are discussed. Mention is made of previous genetic studies within the species *D. Stramonium*, and several interspecific crosses are suggested as likely to yield results of interest to plant breeders.—*A. F. Blakeslee.*

1083. Savelli, R. **Anomalie della plantule e anomalie di germinazione di nicotiana. [Anomalous condition in seedlings and the germination of tobacco.]** Nuovo Gior. Bot. Ital. **27**: 129-153. 1920.—A study of 450,000 seedlings showed as many as 2,800 cases of divergence from the normal in the development of the cotyledons. The tricotyledonous condition was most common. The work is to show the great teratological variability of a given species. Although the author's observations are numerous, he believes they can not qualitatively and quantitatively demonstrate the true state of affairs. He promises to take up later, more extensively and with better material, the interesting study of teratological heredity and its problems.—*Ernst Artschwager.*

1084. Schürhoff, P. N. **Über die Teilung des generativen Kerns vor der Keimung des Pollenkorns. [Division of the generative nucleus preceding germination of the pollen grain.]** Arch. Zellforsch. **15**: 145–159. *1 pl.* 1919.—In *Sagittaria sagittifolia* and *Melandrium album* the cell wall between the vegetative nucleus and the primary generative nucleus disappears, and the cytoplasm becomes confluent. In *Sambucus racemosa* no cell wall is formed between these 2 nuclei. In no case was a special layer of cytoplasm found around either of the 2 ultimate generative nuclei.—*John Belling.*

1085. Setchell, W. A., T. H. Goodspeed, and R. E. Clausen. **A preliminary note on the results of crossing certain varieties of Nicotiana tabacum.** Proc. Nation. Acad. Sci. [U. S. A.] **7**: 50–56. 1921.—The Mendelian results of 3 crosses between certain varieties of tobacco selected as fundamental varieties, or "stem forms," are described. The investigation seeks to unravel the problem of the origin of the numerous cultivated forms by determining which

of the few historically old varieties possess in various combinations all the characters exhibited by commercial varieties, and then to interpret existing varieties on the basis of hybridization with resulting segregation and recombination of characters.—The studies reported are concerned with flower color, flower form, and leaf-base, in which mono- and bigenic results were secured although the data are complicated in some cases by the semi-quantitative nature of the character differences. In general it is concluded that the results demonstrate the complexity of difference from a genetic standpoint between any 2 of the so-called fundamental varieties of *N. tabacum*, and that it is futile to determine affinities on the basis of morphological studies unaccompanied by experimental investigations. More detailed reports of this series of studies are promised.—*J. Johnson.*

1086. SHAMEL, A. D. **Origin of a new and improved French prune variety.** Jour. Heredity 10: 339–343. *Frontispiece, 3 fig.* 1919.—An improved strain of French prune (Prune d'Agen), which originated as a bud sport, is described. The new prune (designated as No. 1418) is roundish-oval in contrast with the pyriform typical French prune. The tree is apparently more vigorous and has larger and heavier foliage than the parent tree. Occasionally spurs are found on the new strain which produce prunes similar to those of the parent variety. The dried prunes of the new strain are said to average 25–30 to the pound, as compared with 50–60 to the pound for the ordinary type.—*A. H. Hendrickson.*

1087. STANDLEY, PAUL C. **Albinism in the black bear.** Science 54: 74. 1921.—The author calls attention to a statement by John Tanner in a book published in 1830, relative to an old albino female bear with 1 albino and 3 pigmented cubs. If albinism in bears is assumed to be recessive, the male parent of the albino cub must have been heterozygous.—*H. L. Ibsen.*

1088. STURTEVANT, G. **Notes from my hybridization records.** Bull. Amer. Iris Soc. 2: 29–30. 1921.—The author gives a list of 87 varieties of Irises which have proved fertile; 7 which have not seeded but have fertile pollen; 4 which have set seed but in which pollen is absent or sterile; and 21 that are sterile. It is stated that plants resulting from wide crosses are usually sterile.—*J. Marion Shull.*

1089. T[ANSLEY], A. G. [Rev. of: HAGEDOORN, A. L., AND A. C. HAGEDOORN. **The relative value of the processes causing evolution.** *294 p.* Martinus Nijhoff: The Hague, 1921.] New Phytol. 20: 124–131. 1921.

1090. THADANI, K. I. **A toothless type of man.** Jour. Heredity 12: 87–88. 1921.—"There occurs in the Hindu Amil community of Hyderabad Sind, a town in India, a type of men who have no teeth. These men are further characterized by a bald head and an extreme sensitiveness to heat. They are known as 'Bhudas' which literally means 'toothless.'" The known facts concerning heredity in these men indicate that the condition is a typical case of sex-linked inheritance. The writer seeks further information.—*Howard J. Banker.*

1091. THJOTTA, TH., AND ODD KINCK EIDE. **A mutating, mucoid paratyphoid bacillus isolated from the urine of a carrier.** Jour. Bacteriol. 5: 501–510. 1920.—An account is given of a paratyphoid bacillus which suddenly began to be given off by a carrier and which differed from the common type in forming masses of mucus enclosing either one or more bacilli in a common capsule. This mucus covering which resulted in a retarded activity on the part of the mutant over the common type, appeared upon repeated cultivation, to be a constant character.—*Chester A. Darling.*

1092. THOMSON, J. ARTHUR. [French Rev. of: BLARINGHEM, L. **Les problèmes de l'hérédité expérimentale. (The problems of experimental heredity).** *12 × 19 cm., 317 p., 20 fig.* Ernest Flammarion: Paris, 1919 (see Bot. Absts. 4, Entry 523).] Scientia 30: 153–154. 1921.

1093. TRACHTENBERG, H. L. **The analysis of the results of Professor Johannes Schmidt's diallel crossings with trout.** Jour. Genetics 11: 75–78. 1921.—The author finds some of

Schmidt's computations defective, in that Schmidt introduces an "arbitrary assumption" which Trachtenberg regards as unnecessary. The latter using another set of equations, arrives at "generative values" slightly different from those obtained by Schmidt. However, the two authors are in substantial agreement as regards results.—*F. B. Sumner.*

1094. WEATHERS, JOHN. **Unusual forms of Iris flowers.** Gard. Chron. **70**: 85. 1921.—This account of 4- and 5-parted teratological flowers of *Iris squalens* (illustrated) and *I. germanica*, includes a speculation as to a former closer structural relationship between monocotyledonous and dicotyledonous plants.—*J. Marion Shull.*

1095. WOODRUFF, LORANDE LOSS. **The present status of the long-continued pedigree culture of Paramecium aurelia at Yale University.** Proc. Nation. Acad. Sci. [U. S. A.] **7**: 41–44. *1 fig.* 1921.—The author attempts to bring up to date and to summarize the chief results obtained from the study of his, now classic, pedigreed culture of *P. aurelia.* This culture was started May 1, 1907, by the isolation of a "wild" specimen found in the laboratory. Four lines from this original organism were then maintained by the daily isolation of a specimen from each line. Although these 4 lines were kept distinct, cells from one line were used to replenish another if it died out. The author kept careful records of time of isolation, division rate, etc., and made permanent preparations from time to time. After 5 years, during which over 3029 generations were attained, the author reached the conclusion that "the protoplasm of a single cell may be self-sufficient to reproduce itself indefinitely, under favorable environmental conditions, without recourse to conjugation. . . . ." Although it was demonstrated that conjugation was not necessary for the continuance of asexual reproduction, and although the organisms showed very little tendency to conjugate, the author showed that conjugation could take place. Thus in mass cultures derived from his pedigreed culture he was successful in obtaining epidemics of conjugation in December, 1913 (at the 4100th generation), and in June, 1920. A careful study of sidelines derived from the main lines showed that there were inherent and periodic increases and decreases in the fission rate. The search for the underlying factors involved in these so-called rhythms led to the discovery of endomixis, whereupon, on May 1, 1915, at the 5071st generation, the author considered the experiment formally closed. Since then, however, he has maintained the culture, but without exact daily observation and record. At the time of writing (December, 1920) the culture had been continued 13.5 years with the attainment of approximately 8400 generations. Therefore the conclusion is still justified that, provided *P. aurelia* lives under favorable conditions, conjugation is not an essential phenomenon in its life history. An internal reorganization process (endomixis) does, however, take place periodically. This gives rise to the following question, which is now under investigation: Is endomixis necessary for the continuance of the race?—*W. H. Taliaferro.*

1096. WOODS, FREDERICK ADAMS. [Rev. of: IRELAND, ALLEYNE. **Democracy and the human equation.** *251 p.* E. P. Dutton & Co.: New York, 1921.] Jour. Heredity **12**: 205–208. 1921.

HORTICULTURE

J. H. GOURLEY, *Editor*

H. E. KNOWLTON, *Assistant Editor*

(See also in this issue Entries 861, 928, 937, 1046, 1054, 1086, 1088, 1191, 1192, 1289, 1316, 1324, 1330, 1357, 1358, 1372, 1402, 1415, 1428)

FRUITS AND GENERAL HORTICULTURE

1097. ANONYMOUS. **Acid for hastening germination.** Florists' Exchange **50**: 211. 1920.—In a previous article it is recommended to steep seed in sulphuric acid for 10-30 minutes, according to the degree of hardness of the seed. After treatment the liquid is drained off

and the seed washed immediately in at least 3 changes of water, and dried sufficiently for sowing. One lot of seed, all from 1 plant and untreated, was sown under glass in the fall. After 3 weeks none had germinated, and the seeds were dug up, sifted from the soil, treated with acid, and replanted; seedlings appeared above ground 4 days later. Of a dozen seed of the same lot sown in the open ground in the following April and left 3 months, only 1 germinated, though the author feels, from his previous experience indoors, that most if not all were alive.—*Lua A. Minns.*

1098. ANONYMOUS. **Protecting trees and shrubs from mice.** Florists' Exchange **49**: 1298. 1920.—W. N. Craig of Brookline, Massachusetts, is quoted as to an effective method of preventing injury. To 5 gallons of lime sulphur (undiluted) are added 5 pounds dry lead arsenate, 3 gallons Scalecide (or some other soluble oil), and 5 pounds salt; directions for applying with a brush are given. The mixture sticks, a second application being unnecessary, and does not harm the trees. The protection of evergreens is more difficult as the brush can not be used effectively, but Mr. Craig thinks that the mixture diluted sufficiently to pass through a nozzle under pressure will prove equally efficient.—*Lua A. Minns.*

1099. ADDIS, J. M. **Excursión horticola. Estudio de los platanos y guineos cubanos. [A survey of Cuban plantains and bananas.]** Rev. Agric. Com. y Trab. [Cuba] **3**: 418–429. *18 fig.* 1920.—This is an account of a search for new varieties of bananas and plantains (*Musa sapientum, M. paradisiaca,* and *M. cavendishii*) to add to the collection at the Agronomy Experiment Station [Santiago de las Vegas, Cuba]. Lists and descriptive notes of the varieties found are included. Some plants near Baracoa were found affected with nematodes.—*F. M. Blodgett.*

1100. ALLEN, W. J., AND R. G. BARTLETT. **Advice to intending growers of bananas.** Agric. Gaz. New South Wales **32**: 575–577. 1921.

1101. BEVAN, W. **Citrus trees.** Cyprus Agric. Jour. **16**: 10–12. 1921.—The author states that there are several varieties of citrus in Cyprus and lists 16 members of the citrus family. Cyprus has in the past participated with Sicily and southern Italy, Spain, Jaffa, and the Greek Islands in exporting oranges and lemons to northern Europe. Although Cyprus is well adapted to citrus cultivation, the latter centers mainly in 3 localities: Early oranges and mandarines in Famagusta; late oranges in Lefka; and lemons in Lapithos and Karavas. The author discusses the soils of these localities and methods of propagation, culture, etc., and states that the Cypriot orange growers plant too closely, and, where water is plentiful, irrigate too freely.—*W. Stuart.*

1102. BEVAN, W. **Notes on propagating olive trees in Italy.** Cyprus Agric. Jour. **16**: 29–30. 1921.—Olive growers of northern Italy encourage tbe growth of suckers (close to the stem) from the roots of big olive trees. When of considerable size—about 1 inch in diameter—they are cut, low down, pruned, and cut back until 10 feet high, and planted in very deep holes filled with good, well broken earth to a depth of 2 or even 3 feet.—*W. Stuart.*

1103. BIOLETTI, FREDERIC T. **Vineyard irrigation in arid climates.** California Agric. Exp. Sta. Circ. 228. *4 p.* 1921.—The main irrigation and wetting of subsoil should take place when the vines are dormant. No part of the soil should remain muddy more than 48 hours while the vines are growing. The soil should become sufficiently dry to stop new growth several weeks before the arrival of cold weather. Young, non-bearing vines, which require less water than bearing vines, are especially sensitive to injury from excess of water soon after they are planted, and from cold weather or frost if maturing new growth late in the autumn.—*A. R. C. Haas.*

1104. CALVINO, MARIO. **Tratado sobre la multiplicación de las plantas. Parte general. [Treatise on the propagation of plants. General part.]** *264 p., illus.* Institute of Graphical Arts: Havana, 1920.

1105. ELLENWOOD, C. W. **Ten year yield record of apples.** Monthly Bull. Ohio Agric. Exp. Sta. 6: 40–45. 1921.—The article briefly states the results secured at the Ohio Station from 1910 to 1919 from 93 varieties of apples. The author gives much information in tabular form, including average date of full bloom, average date of 1st picking, average annual yield, highest and lowest annual yields, and number of crop failures of each variety.—*R. C. Thomas.*

1106. FLIPPANCE, F. **The Cohune nut.** Gardens' Bull. Straits Settlements 2: 432–435. 1921.—*Attalea Cohune* Mart. fruits in Singapore at the age of 25 years and upwards. The palm is described and its possible uses indicated.—*I. H. Burkill.*

1107. GOURLEY, J. H., AND G. T. NIGHTINGALE. **The effects of shading some horticultural plants. A preliminary report.** New Hampshire Agric. Exp. Sta. Tech. Bull. 18. *22 p., 16 fig.* 1921.—The response was somewhat different in different species and horticultural varieties, but always in the same general direction. The area of the leaves studied was increased from 0 to 200 per cent; the thickness on the other hand was greatly reduced, as much as 100 per cent in the apple. Shading intensified the green color of the leaves and rendered the surfaces distinctly glabrous. The root systems of all the herbaceous plants were materially reduced by growing the plants in shade. The flowering of practically all the herbaceous plants was modified by shading, and in some cases it was entirely suppressed. Shaded fruit trees also failed to develop flower buds as freely as unshaded ones. In the majority of species studied the shading resulted in a delay in flowering of from a few days to more than a month.—*J. H. Gourley.*

1108. HOOD, G. W. **Farm horticulture.** *2nd rev. ed., 354 p., illus.* Lea and Febiger: Philadelphia, 1921.

1109. KELSEY, HARLAN P. **Official catalog of plant names.** Florists' Exchange 50: 103. 1920.—This book, soon to be issued, is the result of an extensive piece of work by the Committee on Nomenclature, which represents the associations in the U. S. A. interested in horticultural progress. To the list of plant names which appeared in Bailey's Standard Cyclopedia of Horticulture, 1915, several thousand names have been added, many of them of herbaceous plants and many of them, which have not appeared generally in cultivation, have been newly tested at the Arnold Arboretum. Three societies (American Pomological Society, American Rose Society, and American Iris Society) have furnished complete lists of their respective plant materials. It is hoped that this list will be adopted by every horticultural society and by the U. S. Department of Agriculture for a term of years in order to standardize plant names. It is considered necessary to establish soon a Plant Registration Bureau with which proper descriptions of newly discovered or originated plants may be registered. It is recommended that the general committee, the American Joint Committee, be made permanent so that needed changes in the Catalog may be noted. It is proposed to hold the book in type so that a more complete edition may be published in about 2 years.—*Lua A. Minns.*

1110. MORRIS, ROBERT T. **Nut growing.** *vii + 236 p., 29 fig.* Macmillan Co.: New York, 1921.

1111. O'KANE, WALTER COLLINS. **Building an orchard from a city desk.** Gard. Mag. 33: 181–194. *6 fig.* 1921.—This article recounts the successful establishment of an orchard by a city man.—*H. C. Thompson.*

1112. RIVIÈRE, GUSTAVE, ET GABRIEL BAILHACHE. **Influence de la coleur des murs d'espaliers sur la hâtivité de maturité et la composition chimique des fruits des pêchers qui y sont adossés. [Influence of the color of the fruit walls on the hastening of maturity and the chemical composition of peaches trained against these walls.]** Jour. Soc. Nation. Hort. France 22: 51–54. 1921.

1113. [SCOTT, L. B.] **Nursery stock investigation of the [U. S. A.] Department of Agriculture.** Nation. Nurseryman 29[2]: 189–190. 1921.—An outline is given of recently developed

experimental work in the U. S. A. to determine means of propagating nursery stock (both fruit and ornamental), which in the past has been imported. A study is also being made of better stocks for the various tree fruits.—*J. H. Gourley.*

1114. STARK, LLOYD C. **President's address.** Nation. Nurseryman 29[8]: 162–165. 1921. —Among other activities of the American Association of Nurserymen, the work of standardizing ornamental and fruit nomenclature is described.—*J. H. Gourley.*

1115. THOMAS, P. H. **The black and red currants.** Dept. Agric. Tasmania Bull. 87. *11–13, 1 fig.* 1920.—Cultural treatment and methods of propagation are suggested. The best varieties of black currants are Carter's Black Champion, Lee's Prolific, and Black Naples, while the following red varieties have proved superior: La Versailles, Cherry, and Victoria.—The currant borer (*Ageria tipuliformia* Clerck) is the most destructive pest although certain scale insects attack the bushes.—*J. H. Gourley.*

1116. THOMAS, P. H. **The gooseberry.** Dept. Agric. Tasmania Bull. 87. *13–15, 1 fig.* 1920.

1117. THOMAS, P. H. **The loganberry.** Dept. Agric. Tasmania Bull. 87. *4–6, 1 fig.* 1920.—This fruit is being extensively grown for juices and preserves, for drying, and for making cordial.—Deep, well-drained soils capable of being maintained in a high state of cultivation are recommended. Methods of propagation, trellising, pruning, manuring, and harvesting are described. Disease and insect injury is rare, although an anthracnose sometimes attacks both canes and fruit.—*J. H. Gourley.*

1118. THOMAS, P. H. **The raspberry.** Dept. Agric. Tasmania Bull. 87. *1–4, 1 fig.* 1920.

1119. THOMAS, P. H. **The strawberry.** Dept. Agric. Tasmania Bull. 87. *7–11, 4 fig.* 1920.—Cultural methods, varieties, and handling for market are discussed.—*J. H. Gourley.*

1120. UPHOF, J. C. TH. **Der Anbau von Nüssen in Amerika. [Growing nuts in America.** Gartenwelt 25: *6 fig.* 1921.

1121. UPHOF, J. C. TH. **Die Dattelpalme im Südwesten der Vereinigten Staaten. [The date palm in the southwest of the United States.]** Tropenflanzer 24: 65–72. *1 fig.* 1921.—The author discusses the introduction of the date palm from Africa into the U. S. A., where it is now grown in Arizona and California. The propagation, pruning, and upkeep of a date palm plantation in southwestern U. S. A. are discussed, as well as artificial ripening, and the harvest of 22 varieties during 2 succeeding years.—*J. C. Th. Uphof.*

1122. UPHOF, J. C. TH. **Erfolg der Organisation des Absatzes—Obst-und Gemüseversteigerungen in Holland. [Results of organized marketing—Auctioning fruits and vegetables in Holland.]** Möllers Deutsch. Gärtnerzeitg. 35: 128–130. *2 fig.* 1920.

1123. UPHOF, J. C. TH. **Kühl und gefrier Industrie im Amerikanischen Obstbau. [Cold storage industry in American fruit growing.]** Gartenwelt 24: 375–378. *2 fig.* 1920.—A general consideration is presented of cold storage, pre-cooling, and transport in refrigerators of apples, pears, peaches, grapes, strawberries, and raspberries.—*J. C. Th. Uphof.*

1124. WARD, E. N. **Horticulture.** Agric. Gaz. New South Wales 32: 585–587. 1921. —The article gives instructions in tree planting.—*L. R. Waldron.*

1125. WELLINGTON, RICHARD. **New and noteworthy small fruits and grapes.** Canadian Hort. 44: 70–92. 1921.—A brief description is given of several promising new varieties of strawberries, raspberries, gooseberries, and grapes.—*E. F. Palmer.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

1126. Anonymous. **A project for planting eighty-eight thousand miles of trees.** Amer. Nurseryman 34[2]: 31–32. 1921.—The writer digests the opinions of various interested parties on the desirability of road-side planting of trees.—*J. H. Gourley.*

1127. Anonymous. **A promising hardy privet.** Florists' Exchange 50: 665. *1 fig.* 1920. —According to all reports the new Ibolium privet (*Ligustrum ovalifolium* × *L. Ibota*) wintered perfectly as far north as the Arnold Arboretum, though the common California species (*L. ovalifolium*) was in many cases killed to the ground considerably south of Massachusetts. The new privet is said to be vigorously bushy in habit, quickly responsive to pruning and shaping, of graceful form if left unpruned, flowers profusely, is easily propagated, and endures transplanting at practically any season. The writer's experience with a single test plant in northern New Jersey indicates that it is beyond question hardy, vigorous, and thrifty.—*Lua A. Minns.*

1128. Anonymous. **Alonsoa Warscewiczii.** Florists' Exchange 50: 1231. 1920.—Attention is called to *Alonsoa* as a brilliant flowered, easily grown annual, suitable for planting out in summer and for pot culture in winter; directions for propagating are given. The plant is related to the snapdragon, scarlet in color, the individual flowers in form not unlike those of *Nemesia.*—*Lua A. Minns.*

1129. Anonymous. **National Rose Society's select list of roses, and instructions for pruning.** *121 p., illus.* National Rose Society: London, 1921.

1130. Anonymous. **Nerines.** Florists' Exchange 50: 1070. 1920.—Flowers of these interesting and highly decorative plants (Amaryllidaceae), in red hues and appearing like miniature amaryllis, are becoming a feature in some markets. Nerines are autumn bloomers, many of them flowering before the foliage appears; there are a number of South African species. European growers have raised many hybrids, some of the most striking by the firm of Peter Barr.—Cultural directions are given, followed by a short list of good species and hybrids.—*Lua A. Minns.*

1131. Anonymous. **New foxgloves.** Florists' Exchange 50: 159. 1920.—A new strain of foxglove (*Digitalis*) was exhibited at a recent meeting of the Royal Horticultural Society. The strain was originated by the Rev. W. Wilkes of Shirley Poppy fame. Some of the spikes were 7 feet high, with flowers proportionately large, all beautifully blotched or spotted. At present it does not appear to be in commerce, but the writer thinks that it will prove of real commercial value.—*Lua A. Minns.*

1132. Anonymous. **Rapid cyclamen culture and raising of hybrids.** Florists' Exchange 50: 1070. 1920.—Wollrath & Sons, Waltham, Massachusetts, are credited with having good plants in November from a March sowing, due probably to a combination of favorable conditions.—There are many strains of cyclamen which vary considerably in rate and continuity of growth, size at flowering time, and yield of flowers. Seed has been scarce in the market in recent years, and many growers are saving their own seed.—According to the writer no cyclamen hybrids are recorded. Efforts to cross the *persicum* type and the hardy Neapolitan and others have failed. The greenhouse cyclamen is conceded to have been derived from *C. persicum*, sporting or gradual development being responsible for the new colors. Bulbs of *C. rohlfsianum*, from Tripoli—supposedly a native of the grottoes—have recently been sent to Washington by Dr. O. Fenzi, who expresses the hope that cyclamen specialists will succeed in evolving a new type combining the characters of *Cyclamen* and *Dodecatheon.* While *Cyclamen* species apparently will not cross, it is thought possible that either the greenhouse cyclamen or one of the hardy species may hybridize with *Dodecatheon*, despite the fact that the latter is not tuberous rooted.—*Lua A. Minns.*

1133. Anonymous. **Thalictrum dipterocarpum.** Florists' Exchange 50: 385. 1920.—Thalictrums, though attractive, readily grow from seed, and easily cultured, are seldom seen

in cultivation. Perhaps the most interesting and important species of the genus is the Chinese *T. dipterocarpum* introduced by Veitch in 1907, creating much interest in Europe. It is totally distinct from other species, sending up tall spikes of purplish flowers. A pure white form recently received an award of merit in London; its origin was not given.—*Lua A. Minns.*

1134. ANONYMOUS. **The double snapdragon.** Florists' Exchange 49: 1231. 1920.—The writer records the appearance of a double yellow snapdragon at the nurseries of the Wagoner Floral Co., Columbia City, Indiana; also of the development of double light pink snapdragons at the nurseries of T. D. Hefko, Marshfield, Wisconsin. The latter is said to be entirely double, similar in color to "Nelrose" but an earlier, more persistent bloomer. It ships well and does not quickly drop its lower flowers.—*Lua A. Minns.*

1135. ANONYMOUS. **The new begonia "Peerless."** Florists' Exchange 49: 745. *1 fig.* 1920.—*Begonia socotrana* × a sport of begonia, "Mrs J. A. Peterson," was produced by J. A. Peterson & Sons, Cincinnati, Ohio. The originator says it is a sturdy grower, a continuous bloomer from October to April, holds its flowers, and is easy to propagate. It was registered Feb. 5, 1920.—*Lua A. Minns.*

1136. ANONYMOUS. **The new hybrid begonias.** Florists' Exchange 50: 1183. 1920.—The hybrid English begonias were originated a number of years ago by John Heal of the Veitch firm and first grown in the U. S. A. 10–12 years ago by Henry Scbmidt of North Bergen, New Jersey. Though of surpassing lovliness, Mr. Schmidt found that the plants cast their flowers when subjected to ordinary trade conditions. The type is partly of tuberous and *Socotrana* parentage. The Clibran firm, England, also developed a strain differing somewhat from Veitch's and, as the Veitch firm has dissolved, Clibran has alone continued the development of the type. Whether these gorgeous begonias can be classed as of true commercial value remains to be seen.—*Lua A. Minns.*

1137. ANONYMOUS. **The newly discovered Kurume azaleas.** Florists' Exchange 49: 762. 1920.—Attention is called to a remarkable collection of about 120 Kurume azaleas (*Azalea obtusa*) at the Arnold Arboretum. This collection was purchased by E. H. Wilson from Mr. Akashi, one of the 2 noted growers of these azaleas at Kurume, Japan; the collection reached the Arboretum in April, 1919. These azaleas have been developed from the wild form found, according to tradition, on Mt. Kirishima, on its wind-swept, rocky slopes of volcanic soil at and above an elevation of 3500 feet. Many of these plants at the Arboretum are trained into low standards about 20 inches high, with flattened or convex crowns. The flowers are each about ½–¾ inch across, and are borne in clusters of from 2 to several at the end of every twig in such profusion as to almost completely hide the leaves. The colors are lustrous and pure,—pure white and varying from pink to rose, cerise, lavender, mauve, magenta, and deep scarlet. These azaleas were developed from the wild form by Motozi Sakamota about 100 years ago. Specialists in Kurume recognize some 250 named varieties. More than 50 kinds are quite distinct, though for practical purposes they may be reduced to 25. The Arboretum authorities state that "there is every reason to believe that they will thrive whereever *Azalea amoena* has proved perfectly hardy in the open."—*Lua A. Minns.*

1138. ANONYMOUS. **The Shirley Poppy.** Florists' Exchange 49: 1319. 1920.—The writer comments on the recent interest in Shirley Poppies, the emblem of the American Legion. Though not ideal for cut flowers, plants given plenty of room will bloom profusely for several weeks provided seed pods are removed as rapidly as formed; the range of color is now large. Buds must be cut just as they open, the stem ends passed over a flame or dipped into boiling water, and afterwards plunged into deep vases or cans of water and allowed to remain 1–2 hours; under these conditions the flowers can be successfully shipped.—The Iceland Poppy (*Papaver nudicaule*) is a most important market cut flower in London; it is perennial and blooms for several weeks. While a native of alpine and arctic regions, it suffers from the winter dampness in northwestern U. S. A. Plants from seed sown early will flower the same season. Where not hardy, plants may be transferred to frames or houses. By judicious

handling, flowers should be available whenever needed. Hybrids from the Iceland Poppy and another species are now available. They are similar in habit to the Iceland Poppy, but taller, stronger, and hardier, without as yet, the full range of color.—*Lua A. Minns.*

1139. ANONYMOUS. **The Shirley Poppy.** Florists' Exchange 50: 159. 1920.—The giant form of hybrid Iceland Poppy previously referred to (see preceding entry) is now known as the "Sunbeam Poppy." It is easily raised from seed, is extremely vigorous, and is said to flower well in pots during the winter.—*Lua A. Minns.*

1140. ARMY, A. C. **How to know your irises.** Gard. Mag. 33: 247–249. 1921.—This gives 5 systems of classification which have been suggested by various authorities.—*H. C. Thompson.*

1141. BARNHART, P. D. **A plant conservatory which is different.** Florists' Exchange 49: 1427. *4 fig.* 1920.—The writer reports the erection by Edward L. Doheny, Los Angeles, California, of an unusual type of conservatory for tropical plants. Rain water is collected from the roof, stored in a huge tank, and later distributed (by compressed air) on the plants as a fine shower from perforated pipes extending the full length of the conservatory on both sides of the ridge. The conservatory contains many fine, and some unusual, specimen plants, among the latter 2 of an unknown species of Cycad, brought from Guatemala by the explorer, Ed. Howard, of Los Angeles.—*Lua A. Minns.*

1142. BAXTER, SAMUEL NEWMAN. **A boulevard tree planting without parallel.** Florists' Exchange 50: 1023. *1 fig.* 1920.—Roosevelt Boulevard, in Philadelphia, is a part of the Lincoln Highway between New York and Philadelphia, the former about 7 miles long and consisting of 3 driveways bordered by shrubbery and 6–8 rows of trees. The author names the shrubs as well as a score of the many tree species used. The shrubs are so selected as to furnish bloom throughout the summer. The earlier plantings of trees and shrubs have now developed sufficiently to give good effect. The whole is considered an unusual memorial to a great lover of the outdoors.—*Lua A. Minns.*

1143. BAXTER, SAMUEL NEWMAN. **Must we discard the Oriental plane tree for northern planting?** Florists' Exchange 50: 229. 1920.—The writer records observations on Oriental plane trees (*Platinus orientalis* of the trade) following the severe winter of 1919–20. In the spring many trees appeared dead or made a tardy and feeble effort to produce foliage, which withered or remained small and immature until well into summer. The fatalities were nearly 100 per cent in trees planted the autumn before,—sufficient evidence that fall planting is hazardous, and successful only if the winter following is favorable. A discussion follows regarding the nature of winter injury and susceptibility of this species.—The Oriental plane of most catalogues is really the maple leaved plane (*P. acerifolia*) rather than the true Oriental species. It is suggested that grafting on American plane stock may increase the hardiness of the Oriental species.—*Lua A. Minns.*

1144. BENNET, I. D. **The busy woman's garden book.** *334 p., illus.* Small, Maynard & Co.: Boston, 1920.

1145. BEVAN W. **Otto of rose.** Cyprus Agric. Jour. 16: 23–24. 1921.—The writer refers to accounts published on this subject in previous issues and claims that all the necessary factors, such as soil, climate, and suitability of rose culture and oil distillation to the inhabitants of Cyprus, seem favorable. This statement is followed by a review of a note in the Quarterly Summary of the Royal Botanic Society of London dealing with the traditional discovery of this delightful perfume oil.—*W. Stuart.*

1146. BURKHOLDER, C. L. **Vines for dwellings.** Gard. Mag. 33: 198–199. *2 fig.* 1921.

1147. BURKILL, I. H. **Annual report of the Director of Gardens for the year 1920.** Straits Settlements Government Gaz. [Suppl. 64.] Aug. 12, 1921.—The present is an administration report on the Botanic Gardens, Singapore, and the Waterfall Gardens, Penang.—*I. H. Burkill.*

1148. CLARKE, STEPHENSON R. **Rhododendron notes, 1918.** Rhododendron Soc. Notes 2: 24–25. 1920 [1921].—The issue contains notes on the flowering of rhododendrons, behavior under cultivation, effect of frost, and a note on the peculiarity of some species of exuding on the bud-scales a gummy secretion attracting insects, which become glued fast.—Similar horticultural notes on rhododendrons are the chief contents of the following articles in the same publication: CUTHBERT, KATHLEEN A. **Rhododendrons at Beaufront Castle, 1919** (p. 26); HEADFORT, MARQUESS OF. **Effect of the wet season on rhododendrons at Headfort** (p. 27); JOHNSTONE, GEORGE H. **Comments** (p. 28–29); LODER, GERALD W. (p. 30–31); McDOUALL, KENNETH. **Chinese rhododendron seedlings at Logan** (p. 32); MAGOR, E. J. P. **Rhododendron notes—Lamellen, 1919–1920** (p. 33–35); MAXWELL, HERBERT. **Notes from Monreith, Wigtownshire** (p. 36–37); STIRLING-MAXWELL, JOHN. **Rhododendrons at Carrour, Inverness-shire** (p. 38–39); MOORE, F. W. **Rhododendrons and shade** (p. 40); MOORE, H. ARMYTAGE. **Rhododendron australe and other notes** (p. 41); ROTHSCHILD, LIONEL DE. **Notes on my garden at Exbury** (p. 42–43); WILLIAMS, J. C. **Notes upon the Lapponicum group** (p. 49–50); two articles by BLADENSBURG, JOHN ROSS OF. **A few notes on plants at Castlewellan, Ireland** (p. 44–45) and **Effects of drought at Rostrevor** (p. 46–47). The number also contains notes on other trees and shrubs.—*Alfred Rehder.*

1149. COWPERWAITE, W. T. **Successful planting with really hardy plants.** Gard. Mag. 33: 31–34. *5 fig.* 1921.

1150. CROWELL, S. W. **A talk on bedding roses.** Florists' Exchange 50: 1119. 1920.—The writer has, during the past 25 years, tested more than 2000 varieties of bedding roses in the open ground (in Mississippi) with only a minimum amount of care and attention in order to determine the value of each variety under conditions usually encountered in the gardens throughout the country. Many varieties were found to be admirably suited, but the majority proved wholly unable to withstand the winter. Bedding roses of even robust habit require attention as to soil conditions, drainage, food, sunlight, and pruning. That a garden rose do well on its own roots is of first importance. A long list of bedding roses for the South is given, grouped under the headings: Teas, Hybrid Teas, Bourbons, China Roses, Hybrid Remontant, Rugosas and their hybrids, and Baby Roses. A shorter list is given for the small rose garden.—*Lua A. Minns.*

1151. CUNNINGHAM, MARY P. **A successful planting for "old fashioned" effect.** Gard. Mag. 33: 16–20. *8 fig.* 1921.

1152. D., H. D. **Forcing our native Cypripediums for Easter.** Florists' Exchange 50: 1063. *1 fig.* 1920.—Three native species of *Cypripedium* can be obtained from collectors of native plants at profitable prices. The dormant roots should be potted in late fall (November) and will bloom during late February, March, and April. *C. acaule, C. pubescens,* and *C. spectabile* —often termed *C. reginae*—are described, with detailed directions regarding culture. *C. spectabile* is considered the most beautiful of the 3.—*Lua A. Minns.*

1153. DUNBAR, JOHN. **Native hawthorns for our gardens.** Gard. Mag. 33: 102–107. *5 fig.* 1921.—The native American hawthorns are briefly discussed including an historical sketch and a classification into species and groups, some of which are briefly described.—*H. C. Thompson.*

1154. EGAN, W. C. **Rosa rugosa and its hybrids.** Amer. Nurseryman 34^3: 51. 1921.—A brief history is given of the various forms of this rose now in cultivation.—*J. H. Gourley.*

1155. ELDREDGE, ARTHUR G. **Native prairie flowers for our [U. S. A.] gardens.** Gard. Mag. 33: 314–317. *7 fig.* 1920.—This is a plea for the use of wild plants of the prairies; a list of those likely to dissappear is given.—*H. C. Thompson.*

1156. FARRINGTON, E. I. **Joys of suspense and discovery.** Gard. Mag. 32: 305–307. *4 fig.* 1921.—A brief discussion is presented of the season's novelties in flowers; those worthy of trial are mentioned.—*H. C. Thompson.*

1157. FARRINGTON, E. I. **Some new plants for the window gardener.** Gard. Mag. 32: 261–262. *3 fig.* 1921.

1158. FARRINGTON, E. I. **What's new in shrubs.** Gard. Mag. 33: 38–41. *6 fig.* 1921.

1159. GIBSON, HENRY. **Plants for the porch.** Gard. Mag. 33: 244–245. 1921.

1160. GILLETT, KENNETH. **Native plants for rock gardens.** Florists' Exchange 49: 479, 506. 1920.—The writer notes the tendency toward the greater use of native plants for American gardens due to restrictions on importation and other causes. Though many are commonplace they can be made unusual by proper planting. A list is given of native New England plants suitable for that portion of rock garden shaded for at least a portion of the day; when such plants also thrive in the open sun that fact is mentioned. Most of the plants are briefly described, including soil and moisture requirements. Besides the more common herbaceous perennials, the list includes orchids, ferns, low evergreen plants, and trailers.—*Lua A. Minns.*

1161. GRIFFITHS, DAVID. **A timely hint on Easter lily handling.** Florists' Exchange 50: 763. *1 fig.* 1920.—The attention of florists growing Easter lilies for the first time is called to the necessity of handling the seedlings before winter sets in, especially from Washington, D. C., north. "There are 2 reasons for this: (1) The seedlings of this lily do not go dormant until they blossom, unless forced to do so; the young plants consequently go into the winter in vegetative condition. (2) They are necessarily shallow, having been set out as very small plants." If wanted for bloom the 1st year, the seedlings should be potted before cold weather and given the ordinary treatment for pot-grown Easter lily bulbs. Otherwise the plants should be dug before the temperature goes below 25°F., dried until the leaves pull off easily, reset in rich soil about 4 inches deep, and later in the season mulched with well-rotted manure, which should remain on the beds next season. The writer's experience with lilies in Washington proves the necessity of resetting for successful outdoor wintering.—*Lua A. Minns.*

1162. GRIFFITHS, DAVID. **A timely hint on lily production.** Florists' Exchange 49: 708. *1 fig.* 1920.—Carefully selected plants of great vigor and good production should be used as seed parents. Two plants, each with 4 (better 3) pods, will yield enough seed (250 or more per pod) for the average grower. Seed-producers may receive light feeding once a week from the time buds appear. Experiments at Washington D. C., show that the Easter lily is most profitably treated as an annual, 15-months-old plants yielding as good and as many flowers as 3-year, 8–9-inch bulbs; also, time and labor are conserved and disease practically eliminated. The belief is expressed that an early strain can be selected, the seed of which can be sown in frames in late autumn (germinating in April), and the seedlings planted out in May. Such plants would have 6 months in the open, after which they would be potted and forced for Easter, reducing the time for growing to 11 months and eliminating the use of the greenhouse in spring.—*Lua A. Minns.*

1163. GRIFFITHS, DAVID. **Growing easter lilies in the hardy garden.** Gard. Mag. 33: 107–108. *1 fig.* 1920.

1164. HAGENBURGER, CARL. **Substitutes for debarred blooming plants.** Florists' Exchange 50: 1121. 1920.—It appears that the Azalea is the only blooming plant whose exclusion by quarantine is very keenly felt. There are no real substitutes, the nearest approach being the French hydrangea, and it seems probable that in the near future more of these will be grown than has hitherto been the case with Azaleas. Among substitute plants, *Ardisia*, *Aucuba*, and *Solanum* are mentioned; it appears that large quantities of the first 2 will be grown profitably in the South. Solanums are now grown in large numbers. The following are listed and briefly described: *Erica*; *Poinsettia*; begonias of the semi-tuberous and *semperflorens* types; *Primula malacoides* and *P. obconica*; late-flowering chrysanthemums for Thanksgiving; *Cyclamen*; *Genista*; *Bougainvillea*; Marguerite; *Delphinium, Belladonna,* and roses.—*Lua A. Minns.*

1165. HATFIELD, T. D. **Raising yews from seed at Wellesley.** Gard. Mag. **33**: 23–25 *9 fig.* 1921.

1166. HUDSON, LESLIE. **Annuals to fill the gaps.** Gard. Mag. 32: 249–250. *3 fig.* 1921.

1167. JOHNSTON, R. B. **Saving the red cedars for our gardens.** Gard. Mag. **32**: 329–331. *4 fig.* 1921.—A brief discussion is given of the red cedar as an ornamental tree and its importance as a host for one stage of the apple rust, *Gymnosporangium Juniperi-virginianae* Schw. The writer believes that its use as an ornamental is not justified, particularly if planted near orchards.—*H. C. Thompson.*

1168. KING, LOUISA (YEOMANS). [MRS. FRANCIS KING.] **Pages from a garden note-book.** *291 p., illus.* C. Scribners Sons: New York, 1921.

1169. MITCHELL, SIDNEY B. **Irises in the California garden.** Gard. Mag. **33**: 257–258. *4 fig.* 1921.

1170. STEELE, ASA. **The gardens of France.** Gard. Mag. **33**: 320–325. *8 fig.* 1920.—The article deals with ornamental plantings rather than with fruits and vegetables.—*H. C. Thompson.*

1171. STEELE, FLETCHER. **Color charts for gardeners.** Gard. Mag. **33**: 185–186. 1921.

1172. STILES, E. C. **Common sense in planning your grounds.** Gard. Mag. **32**: 236–238. *3 fig.* 1921.—The author discusses the planning of the home grounds, including the location of the house and other buildings and the planting plan of the grounds; 3 plans are given to illustrate different arrangements.—*H. C. Thompson.*

1173. THEISS, LEWIS EDWIN. **"Under his own vine and fig tree." The productive plant as a landscape feature.** Gard. Mag. **32**: 239–241. *5 fig.* 1921.—The author discusses the use of fruit trees and other fruit plants in beautifying the home grounds.—*H. C. Thompson.*

1174. UPHOF, J. C. TH. **Wenig bekannte Blütenpflanzen aus den westlichen Staaten Nordamerikas. [Little known flowering plants of the western states of North America.]** Gartenwelt **24**: 317–319, 327–328. *8 fig.* 1920.—More wild species of flowering plants in western U. S. A. should be introduced in the gardens of Europe, including *Lysichitum camtschatcense* (L.) Schott., *Lathyrus splendens* Kellog, *Delphinium cardinale*, Hook., species of *Eriogonum* and *Dodecatheon*, *Eustoma Russelianum* (Hook.) Grisch, *Calochortus Kennedyi* Benth., *Erythraea venusta* Gray. For hybridization with existing garden plants *Lathyrus splendens*, *Trollius albiflorus* (Gray) Rydl, and various species of *Pentstemon* are suggested.—*J. C. Th. Uphof.*

1175. WILD, HENRY. **Dwarf evergreens for pictoral relief in border planting and bedding.** Gard. Mag. **33**: 191–194. *5 fig.* 1921.

1176. WILD, HENRY. **Evergreens for hedges and screens.** Gard. Mag. **33**: 124–127. *6 fig.* 1921.

1177. WILDER, LOUISE BEEBE. **Pinks for border and rock garden.** Gard. Mag. **32**: 255–256. *1 fig.* 1921.

HORTICULTURE PRODUCTS

1178. BETSCHER, C. **What dahlia produces the most tubers?** Florists' Exchange **49**: 635. 1920.—As a rule the Show Dahlia produces the heaviest clumps of tubers. In good soil "Bird of Passage" and "Ruby Queen" are heavy yielders. "Mrs. Chas. Turner" (decorative), "Souv. Douzan," and "Nymphae" are also very productive. In each class a few are heavy. The writer has observed that in rich soil and under similar conditions, such as length of season, all yield about the same weight.—*Lua A. Minns.*

1179. Bevan, W. **Pirina.** Cyprus Agric. Jour. 16: 37. 1921.—Pirina is a liquid product obtained from the olive. Analysis shows that it contains 5–12 per cent of oil depending on method of extraction. In its crude state it is suitable only for fuel purposes, though it is claimed that the oil, if it could be extracted, would be very useful in soap making.—*W. Stuart.*

1180. Cruess, W. V., and A. W. Christie. **Dehydration of fruits (a progress report).** California Agric. Exp. Sta. Bull. 330. *60–77.* 1921.—A table is given listing in brief form the tested methods of preparation and conditions of dehydration recommended for various fruits. These recommendations apply to the air-blast tunnel type of dehydrater, which so far has proved most satisfactory for general fruit dehydration.—Further investigations are under way, many by operators of debydraters, on various phases of dehydration. It is fully expected, therefore, that many of the present practices may be greatly modified during the next few years, making it necessary to revise accordingly the recommendations given in the submitted tahle.—*A. R. C. Haas.*

1181. M[ilsum], J. N. **Crop records of oil palms.** Agric. Bull. Federated Malay States 8: 247–255. 1920 [1921].—The yield of the oil-palm, *Elaeis guineensis*, is given.—*I. H. Burkill.*

1182. Wilmore, W. W. **What dahlia produces the most tubers?** Florists' Exchange 49: 706. 1920.—The author has found the following varieties heavy producers in the order named: "Earl of Pembroke," "Mrs. Chas. Turner," "Cornucopia," "A. D. Livoni," "Robert Broomfield," and "Kreimhilde." He has known the 1st to produce, from a single small tuber, clumps weighing 6–8 pounds, and thinks it probably could be made to yield 10–12 pounds on heavily fertilized soil. For root production seedlings as planting stock would be more economical than tubers, the 1st year seedlings being conspicuously heavy root producers. It is considered likely that the chemical composition of different varieties will vary as widely as it does in the sugar beet.—*Lua A. Minns.*

VEGETABLE CULTURE

1183. Addis, J. M. **Experimentos con boniatos. [Experiments with sweet potatoes.]** Rev. Agric. Com. y. Trab. [Cuba] 4: 478–479. 1921.—Yields of different varieties of sweet potatoes (*Ipomaea batatas*) and yield of plants grown from large, medium, and small potatoes of each variety are compared. In 1920 the plants from medium-sized tubers gave tbe larger yields in most cases.—*F. M. Blodgett.*

1184. Deshmukh, G. B. **Some tests of garden vegetables in Singapore-lettuces.** Gardens' Bull. Straits Settlements 2: 421–422. 1921.—Lettuces of different origin were cultivated comparatively with the object of ascertaining whicb races do best in the climate of Singapore.—*I. H. Burkill.*

1185. Gibson, Henry. **When you make your plans.** Gard. Mag. 32: 232–235. *5 fig.* 1921.—The author discusses the planning of a practical garden including vegetables, fruits, and various kinds of herbaceous and woody ornamentals. Directions and plans for the vegetable garden are given.—*H. C. Thompson.*

1186. Kruhm, Adolph. **Why dont the lettuces "head"?** Gard. Mag. 33: 113. 1921.—This article answers the question by suggesting varieties which will form heads under different temperature conditions provided the plants are properly spaced and given good cultural treatment.—*H. C. Thompson.*

1187. Vilmorin, J. de, et A. Meunissier. **Formes diverses de haricots d'Espagne. [Diverse forms of Spanish beans.]** Jour. Soc. Nation. Hort. France 22: 131–134. 1921.—The variability of the Spanish bean (*Phaseolus multiflorus*), which is grown as an ornamental climber in France, is discussed. Discriptions are given of various forms which have originated by accidental crossing with the common bean. From a black-seeded variety 10 distinct colors appeared in the 2nd year and at least 40 forms could be recognized.—*H. C. Thompson.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 1017, 1040, 1042, 1094, 1285)

1188. COSTANTIN, J. **Note sur les collections micrographiques de la chaire de botanique (organographie et physiologie). [Note on the micrographic collections of the chair of botany (organography and physiology).]** Bull. Mus. Hist. Nat. [Paris] 26: 336. 1920.—The collection of anatomical preparations of the laboratory of organography and physiology contains over 40,000 sections; these are principally of phanerogams. About 7,500 are of fossil plants.—*E. B. Payson.*

1189. COSTERUS, J. C. **Dialyse du pistil de Rhododendron sp. [Dialysis of the pistil of Rhododendron sp.]** Recueil Trav. Bot. Néerland. 18: 231–235. *1 pl.* 1921.—An instance of dialysis in *Rhododendron* is recorded.—*J. C. Th. Uphof.*

1190. HABERLANDT, GOTTLIEB. **Physiologische Pflanzenanatomie. [Physiological plant anatomy.]** *5th ed., rev. and enlarged, 670 p.* Leipzig, 1918.

1191. LONGO, B. **Ricerche sul melo "senza fiori" (Pyrus apetala Münch.). [Investigation of an apple "without flowers."]** Atti R. Accad. Lincei Roma Rendiconti (Cl. Sci. Fis. Mat. e Nat.) 29²: 290–291. 1920.—This plant was found to have minute pistilliferous flowers. The flowers are not pollinated, not being visited by insects, but give rise to fruit without seeds. The case is thus interpreted as one of true parthenocarpy. The ovaries contained ovules. Trials at pollination succeeded, and seeds developed.—*F. M. Blodgett.*

1192. PETRI, L. **Sulle cause di arresto di sviluppo dell' ovario nel fiore dell' olivo. [On the cause of the arrested development of the ovary in the flower of the olive.]** Atti R. Accad. Lincei Roma Rendiconti (Cl. Sci. Fis. Mat. e Nat.) 29¹: 472–477. 1920.—The author disagrees with the conclusions of Pirotta [see Bot. Absts. 6, Entry 133], who groups olives into 4 classes depending on the presence or absence of reduction in stamens or pistil or both. He cites one of his previous publications to show that reduction of the pistil depends on surrounding conditions, particularly on water supply to the tree or branch, and that the reduction of floral parts varies in the same tree from year to year and in different parts of an orchard or tree according to conditions.—*F. M. Blodgett.*

1193. PROUTY, W. F. **A more phenomenal shoot.** Science 54: 170. 1921.—Another shoot [see Bot. Absts. 10, Entry 1196] from *Paulownia tomentosa* is here reported to have made a seasonal growth in 1920 of 21 feet 6 inches, with 24 internodes and a basal circumference of 10 inches.—*C. J. Lyon.*

1194. PROVASI, T. **Contributo allo studio del nettarostegi. [Contribution to our knowledge of nectar-protecting devices in flowers.]** Nuovo Gior. Bot. Ital. 27: 154–206. 1920.—A review is presented of previous work on the subject of nectar-protecting devices, followed by the author's own investigation. The morphological classification of these "Saftdecken" reveals many types commonly observed in various plant families, notably the Labiatae, Borraginaceae, Scrophulariaceae, Solanaceae, and others. He sums up his general observations of the morphology and anatomy of these structures and lists the names of the plants studied and the classes to which they belong.—*Ernst Artschwager.*

1195. SEARS, PAUL B. **Variation in Taraxacum.** Science 53: 189. 1921.—"Degree of leaf dissection is correlated with the age of a given rosette," older plants having leaves more dissected. If they appear to have smooth, entire leaves, upon examination it will be found that such leaves grow from younger branches.—*C. J. Lyon.*

1196. WELLS, B. W. **A phenomenal shoot.** Science 54: 13–14. 1921.—A shoot from a trunk of *Paulownia tomentosa* (Thunb.) Steud. grew to the length of 19 feet 5 inches in 1 season (1919). [See also Bot. Absts. 10, Entry 1193.]—*C. J. Lyon.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*
L. H. TIFFANY, *Assistant Editor*

(See also in this issue Entries 948, 970, 977, 1247, 1348, 1358, 1393)

1197. BUSCH, W. **Beitrag sur Kenntnis der Coccolithophoridae. [Contribution to our knowledge of the Coccolithophoridae.]** Arch. Naturgesch. Abt. A 85: 50–54. *Fig. 1–2.* 1919 [1920].—Descriptions of *Syracosphaera atlantica* n. sp. (*S.* spec. Lohmann?) and *Coccolithophora leptopora* (Muw. & Blackm.) Lohmann are presented.—*C. E. Allen.*

1198. GLEISBERG, WALTHER. **Beitrag zur Algenflora des Proskauer Teichgebietes. [Contribution to the algal flora of the Proskau group of ponds.]** Ber. Deutsch. Bot. Ges. 38: 199–207. *Fig. 1–2.* 1920.—A list of Desmidiaceae and Protococcales collected by the author, and of additional members of the same groups reported by Kirchner, in a group of ponds near Proskau is presented together with brief notes on the ecology of the ponds and on several new varieties.—*R. M. Holman.*

1199. JØRSTAD, IVAR. **Undersøkelser over zygoternes spiring hos Ulothrix subflaccida Wille. [Investigations on the germination of zygotes of Ulothrix subflaccide.]** Nyt. Mag. Naturvidenskab. 56: 61–68. *Fig. 1–25.* 1919.—Jørstad has described the germination of the resting spores of *Ulothrix subflaccida*, a marine member of the genus. He reviews the work of Dodel and Klebs on the fresh water species, *Ulothrix zonata.* According to Dodel, the contents of the zygote, after a relatively long period, divides into 2–14 non-motile cells, each showing an eye-spot and an organ for attachment. Klebs observed in cultures the formation of "zygotes" with and without conjugation. In about a month both kinds germinated readily, producing 2–4 non-motile cells without eye-spot. Further, no organ of attachment was observed. Klebs suggested that the resting cells which germinated by forming 2 cells were non-sexual while the others, producing in germination 4 cells, were formed by the fusion of gametes.—Jørstad's observations agree in the main with those of Dodel. He describes the resting cells or zygotes as generally spherical, sometimes egg-shaped, frequently with an attachment organ, and very variable in size. On germination the contents divides into a considerable number of cells, as many as 14, depending upon the size of the zygote. These cells are non-motile, have no eye-spot, and the chromatophore can not be readily seen, although the pyrenoid is evident. The cells may form new filaments before escaping from the zygote wall.—*A. Gundersen.*

1200. ROSE, M. **Recherches biologiques sur le plankton. [Biological researches on plankton.]** Bull. Inst. Oceanograph. Monaco 385. *16 p.* 1921.—The work was done with copepods, but the methods are of interest in that they may be largely paralleled by workers on phytoplankton.—*T. C. Frye.*

1201. SAUVAGEAU, CAMILLE. **Observations biologiques sur le Polysiphonia fastigiata, Grev. [Biological observations on Polysiphonia fastigiata.]** Recueil Trav. Bot. Néerland. 18: 213–230. *Fig. 6.* 1921.—*Polysiphonia fastigiata* is not an epiphyte but a parasite; the rhizoids are endophytic in character. The exclusive presence on *Ascophyllum* and *Fucus* argues for an adoption of the parasitic habit, though the species appears less on the latter than on the former. Notwithstanding its parasitic nature, the spores easily germinate in cultures and form small plants.—*J. C. Th. Uphof.*

1202. SCHRÖDER, BRUNO. **Schwebepflanzen aus dem Saabor-See und aus den grösseren Seen bei Liegnitz. [Phytoplankton from Saabor Lake and from the larger lakes near Liegnitz.]** Ber. Deutsch. Bot. Ges. 38: 122–135. 1920.—The author enumerates the forms collected with plankton net in 5 small Silesian lakes, presents a table of the distribution in these lakes of the 92 species found, discusses the ecology of certain of the forms, and describes new or critical organisms which were encountered. The new species are *Scenedesmus arthrodesmiforme* and

S. pseudodispar. The paper closes with a table in which Schlawa Lake, the 5 lakes discussed in the paper, and 2 ponds in the same vicinity are compared as to position, altitude, form, size, depth, number of species of different classes of algae, and ecological character.—*R. M. Holman.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See in this issue Entries 970, 983, 990, 993, 997)

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

(See also in this issue Entries 931, 932, 934, 935, 936, 954, 968, 969, 1041, 1071, 1075, 1091, 1354, 1355, 1359, 1393, and others in the section Pathology)

FUNGI

1203. Anonymous. **Index to American mycological literature.** Mycologia 13: 195–199. 1921.

1204. Bataille, Frederic. **Cortinarius suaveolens Bataille et Joachim nov. sp.** Bull. Trimest. Soc. Mycol. France 36: 85–86. 1920.—The species differs from *C. calochrous* and *C. dibaphus* in having a characteristic perfume and color; it is evidently intermediate between them.—*D. S. Welch.*

1205. Bourdot, H. **Two new Basidiomycetes.** Trans. British Mycol. Soc. 7: 50–54. *Fig. 1–2.* 1921.—*Corticium Pearsonii* and *Heterochaete crystallina* are described as new. **Heterochaetella** is erected as a new sub-genus within the genus *Heterochaete.*—*W. B. McDougall.*

1206. Bourdot, H., et A. Galzin. **Hyménomycètes de France—VI. Astérostromés.** [French Hymenomycetes.] Bull. Trimest. Soc. Mycol. France 36: 43–47. 1920.—Speculations are presented as to the origin of the stellate cystidia characterizing this group. A description of the genus *Asterostroma* with 3 species and *Asterodon* with 1 species is given.—*D. S. Welch.*

1207. Bourdot, H., et L. Maire. **Notes critiques sur quelques Hyménomycetès nouveaux ou peu connus.** [Some new or little known Hymenomycetes.] Bull. Trimest. Soc. Mycol. France 36: 69–85. *1 fig.* 1920.

1208. Chenantais, J. E. **Sillon et pores germinatifs.** [Germinal ridge and pores.] Bull. Trimest. Soc. Mycol. France 36: 29–33. *9 fig.* 1920.—The question is raised as to the value of germinal ridges in determining relationships, particularly in the Xylariaceae and *Rosellinia.* Many satisfactory relationships have been established without reference to this character. Examples of *Anthostoma, Hypoxylon,* and *Clypeosphaeria* show that minute spore characters are not always reliable. The germinal ridge merely indicates the manner of dehiscence in certain types of spores. On the other hand, such a structure should not be overlooked since it should serve to indicate that other more conclusive affinities may exist.—*D. S. Welch.*

1209. Duvernoy, A., et R. Maire. **Une nouvelle Dématiée à conidies pseudo-endogenes.** [A new form of the Dematiaceae with pseudo-endogenous conidia.] Bull. Trimest. Soc. Mycol. France 36: 86–89. *6 fig.* 1920.—**Endophragmia** nov. gen. ad interim is described with *E. mirabilis* n. sp. ad interim as the type. A peculiar method of conidia formation is described. The 1st spore forms at the tip of a conidiophore in a perfectly normal way. The 2nd forms

inside a collar left by the 1st. After being raised on a short stalk it is discharged, leaving another collar above the 1st.—*D. S. Welch.*

1210. ELLIOTT, JESSIE S. BAYLISS, AND HELENA C. CHANCE. **Three fungi imperfecti.** Trans. British Mycol. Soc. 7: 47–49. *Fig. a–b.* 1921.—Cytotriplospora *Pini* is described as a new genus and species. The other 2 fungi discussed are *Naemospora Strobi* Allescher and *Fusicoccum bacillare* S. & P.—*W. B. McDougall.*

1211. FERDINANDSEN, C., ET Ø. WINGE. **Uromyces Airae-flexuosae sp. nov.** Bull. Trimest Soc. Mycol. France 36: 162–164. *Fig. 1–2.* 1920.—The authors find teleutospores of a *Uromyces* associated with the well-known *Uredo Airae-flexuosae*, and accordingly establish *Uromyces Airae-flexuosae* sp. n.—*D. S. Welch.*

1212. FRON, ET LASNIER. **Sur une Chytridinée parasite de la luzerne. [A chytrid parasitic on alfalfa.]** Bull. Trimest. Soc. Mycol. France 36: 53–61. *Pl. 5, 3 fig.* 1920.—*Urophlyctis Alfalfae* produces tumors or hypertrophies on alfalfa, affecting only the aerial parts. It is widespread in distribution and probably one of the causes of premature withering of alfalfa. The parasite develops within the tissue of the host. "Resting sporangia" are produced. There is a slight development of mycelium which aids in spreading the infection. No true mitosis is observed nor anything suggesting sexuality.—*D. S. Welch.*

1213. GONZÁLES FRAGOSA, R. **Quelques mots sur une nouvelle Lophiostomacée. [Remarks on a new member of the Lophiostomataceae.]** Bull. Trimest. Soc. Mycol. France 36: 103–106. *Fig. 1–2.* 1920.—A description is presented of *Lophiotrema Pteridis* f. n. ad interim on fronds of *Pteris aquilina.*—*D. S. Welch.*

1214. GUILLIERMOND, A. **Zygosaccharomyces Pastori, nouvelle espèce de levures à copulation hétérogamique. [A new heterogamic species of yeast.]** Bull. Trimest. Soc. Mycol. France 36: 203–211. *Pl. 11–13, 1 fig.* 1920.—Another addition to the growing list of heterogamic yeasts is described. The morphological and cultural characters of *Zygosaccharomyces Pastori* n. sp. are given.—*D. S. Welch.*

1215. GUILLIERMOND, A., ET PEJU. **Une nouvelle espèce de levures du genre Debaryomyces, D. Klöckerii, n. sp. [A new species of yeast.]** Bull. Trimest. Soc. Mycol. France 36: 164–171. *Pl. 6–10.* 1920.—A detailed description of the morphological and cultural characters of a new species of yeast is given. This form, *Debaryomyces Klöckerii* n. sp., is of unusual interest since it appears to be a form intermediate between the Saccharomycetaceae and the Endomycetaceae.—*D. S. Welch.*

1216. JOHNSTONE, R. B. **Audibility of the spore discharge in Otidea leporina.** Trans. British Mycol. Soc. 7: 86. 1921.—The puffing of *Otidea leporina* was found to be accompanied by a hissing sound that could be distinctly heard at a distance of 6 feet.—*W. B. McDougall.*

1217. KOBEL, FRITZ. **Zur Biologie der Trifolien-bewohnenden Uromycesarten. [Biology of the forms of Uromyces on Trifolium.]** Centralbl. Bakt. II Abt. 52: 215–235. 1920.—A morphologic and biologic study of the autoecious species of Uromyces on clover is presented. The biologic species were found to be of rather wider range than usually described. Studies on the sculpturing, size, and form of the teleutospores would indicate that the species consist of a conglomerate of races.—*M. A. Raines.*

1218. LAUBERT, R. **Schmarotzer Pilze und Pflanzenkrankheiten aus Polen und Masuren. [Parasitic fungi and plant diseases from Poland and Masuria.]** Centralbl. Bakt. II Abt. 52: 236–244. 1920.—The author presents a classified list of parasitic fungi collected while serving in the army 1915–1918.—*Anthony Berg.*

1219. LLOYD, C. G. **Mycological Notes No. 62.** 904–944. *Fig. 1598–1747.* 1920.—A portrait of J. C. Arthur appears on the cover and is followed in the text by a chronological arrange-

ment of the chief events in his life.—The body of the publication contains, among other things, the following species described as new: *Lenzites abietis*, Colorado; *Irpex crassitatus*, Iowa; *Calocera palmata*, Massachusetts; *Aleurodiscus grantii*, Washington; *A. crassus*, Oregon; *Exidia zelleri*, Oregon; *Polyporus peakensis*, Colorado; *Laschia chippii* and *Xylaria kedahae*, Straits Settlements; *Cordyceps rickii* and *Isaria myrmicidae*, Brazil; *Hydnum pulcher*, *Polyporus arenosobasus*, *Dacryomyces australia*, and *Aleurodiscus capensis*, South Africa; *Fomes longoporus* and *F. gossweileri*, Portuguese West Africa; *Dendrocladium fruticola*, *Polyporus fuscatus*, *P. biogilvus*, *P. vandykei*, and *Fomes durissimus*, Africa; *Isaria cocoa*, Philippines; *Aleurodiscus orientalis*, Japan; *Daedalea ridleyi*, Singapore; *Cordyceps almonae* and *Auricula totarae*, New Zealand; *Polyporus molliculus*, Ceylon; and *P. pseudogilvus*, Cuba.—Notes on the following genera are more or less monographic: *Aleurodiscus*, *Cordyceps*, *Poronia*, and *Thamnomyces*. A considerable number of notes on other genera are also included.—The plant that has passed in American mycology as *Sebacina dendroidea* is now referred to *Institale bombacina* of the Fungi Imperfecti.—*L. O. Overholts.*

1220. LLOYD, C. G. **Mycological Notes No. 63.** 945–984. 1920.—The number is given over almost entirely to listing collections received, with occasional notes. Announcement is made that hereafter material previously noted in the "Letters" will be included in "Mycological Notes;" The Letters thus end with No. 69.—The present issue lists collections received from correspondents in various parts of the U. S. A., from France, Cuba, Java, South Africa, Mexico, India, Africa, Bahamas, Brazil, New South Wales, Singapore, Australia, Jamaica, New Zealand, Hawaii, West Africa, Japan, Denmark, Barbados, Ceylon, England, Tasmania, Belgian Congo, East Africa, Guam, and Scotland.—New species are described as follows: *Geaster caespitosus*, Missouri; *Merulius carbonarius*, Washington; *Irpex pallidus*, Bahamas; *Hexagona umbrosus*, Singapore; *Lycoperdon tephrum*, Africa; *Polyporus multisetosus*, Australia; and *P. verecundus*, Guam.—The usual number of miscellaneous notes on various genera are included.—*L. O. Overholts.*

1221. LLOYD, C. G. **Mycological Notes No. 64.** 985–1029. *Fig. 1748–1859.* 1920.—The cover carries a portrait of the late G. W. Clinton, of Buffalo, New York, together with a short biographical account.—New species are described as follows: *Exidia beardsleei*, North Carolina; *Tylostoma mohavei*, California; *Polystictus rarus*, South Carolina (?); *Stereum incisum*, *S. cuneoforme*, *Kretzschmaria botrites*, *Laschia similis*, *Polystictus bicolor*, *P. pallidus*, *P. anomalosus*, *Polyporus cystididoides*, *P. ater*, *P. acervatus*, *Hydnum ferreus*, *H. maliensis*, and *Hexagona angulata*, Singapore; *Polystictus subcaperatus* and *Podaxon anomalum*, Australia; *Thelephora penicillata*, *Tremella microspora*, and *Cytidia simulans*, South Africa; *Ptychogaster niger*, West Africa; *Polyporus angolensis*, *Polystictus luteo-affinis*, and **Phyllotremella** (nov. gen.) *africanus*, Africa; *Polystictus cuneato-brunneus*, *Fomes magnosporus*, and *Hexagona ferruginosa*, Philippines.—In addition, specimens of fungi are recorded as having been received from various parts of the U. S. A., from India, South Africa, France, Canada, Singapore, Holland, Chile, Japan, New Zealand, England, Philippines, Ecuador, Zanzibar, Brazil, Jamaica, Cuba, and Africa. The usual number of miscellaneous notes on species of various genera are included.—*L. O. Overholts.*

1222. LLOYD, C. G. **Mycological Notes No. 65.** 1029–1101. *Fig. 1859–2018.* 1921.—The usual cover page is given over to a photograph of Oreste Mattirolo, the Italian mycologist, and a short biographical sketch follows. A smaller portrait of Rev. F. Theiszen is also presented, together with a notice of his death.—New species are described as follows: *Melanogaster mollis*, Wyoming; *Merulius erectus*, Minnesota; *Tremellodendron hibbardii*, Massachusetts; *Tremella carneo-alba*, North Carolina; *Hypoxylon magnosporum*, New Jersey; *Lycoperdon globosepiriforme*, Colorado; *Hydnangium pallidum*, *Trametes rugoso-picta*, *Merulius ochraceus*, and *Aleurodiscus scopulatus*, Ecuador; *Podocrea transvaalii* and *Tylostoma transvaalii*, South Africa; **Dubiomyces** (nov. gen.) *viridis*, Jamaica; *Polyporus flabellaris*, *P. superniger*, *P. oroniger*, *P. armadillus*, *P. ramosii*, *P. melanoporus*, *Trichoscypha magnispora*, *Podocrea anomala*, *Xylaria divisa*, *X. timorensis*, *Stereum auriscalpium*, *S. felloi*, *Pterula incisa*, and **Phyllomyces** (nov. gen.) *multiplex*, Philippines; *Polystictus albobadius*, *Polyporus sepias*,

and *P. burkillii*, Singapore; *Stereum (Hymenochaete) speciosum*, Porto Rico; *Trametes versicolor*, Chile; *Hypoxylon rostratum*, *Diploderma cretaceum*, *Trametes subminima*, *Polystictus radiato-rugosus*, and *Lentinus atro-lucidus*, Tasmania; *Xylaria composita*, West Africa; *Cordyceps thwaitsii*, Ceylon; *C. hillii*, New Zealand; *Fomes latistipitatus*, **Phyllocarbon** (nov. gen.) *yasudai*, *Aleurodiscus tsugae*, *A. stereoides*, and *Polyporus juxta-rugosus*, Japan; *Ptychogaster aureus* and *Polyporus victoriensis*, Australia; *Polyporus duroporus*, China; *Trametes guatemalensis*, Guatemala.—Notes on the genera *Kretzschmaria* and *Melanogaster* are more or less monographic. Miscellaneous notes on other genera are included.—Specimens are recorded as being received from various parts of the U. S. A., from Canada, India, South Africa, Bahamas, France, Switzerland, Porto Rico, Singapore, Australia, Fiji Islands, Holland, New Zealand, China, Syria, Philippines, Borneo, Sumatra, Belgium, Italy, Ecuador, Zanzibar, Brazil, Tasmania, and Belgian Congo.—*L. O. Overholts.*

1223. Mangin, L., et F. Vincens. **Sur un noveau genre d'Adelomycetes, le Spirospora Castaneae n. sp. [A new genus of Adelomycetes.]** Bull. Trimest. Soc. Mycol. France **36**: 89–97. *Fig. 1–7.* 1920.—A new fungus has been discovered in examining chestnuts affected with black-rot. The organism seems to belong near *Mycogone* in the Adelomycetes; the new genus **Spirospora** is established and the single species *S. Castaneae* described. The note states that the word Adelomycetes has been previously suggested by one of the authors to replace the expression Fungi Imperfecti.—*D. S. Welch.*

1224. Maublanc, M. **Contribution à l'étude de la flore mycologique brésilienne. [Contribution to the flora of Brazil.]** Bull. Trimest. Soc. Mycol. France **36**: 33–43. *Pl. 2–4, fig. 1–11.* 1920.—The present article begins a series on fungi collected by the author in Brazil (1912–14). Under the heading. "I. Fungi Novi Braziliensis," appear descriptions of the following: *Dimeriella caracaensis* n. sp.; *Sphaerella ilicicola* n. sp.; *Metasphaeria stromaticola* n. sp.; *Leptosphaeria paraguariensis* n. sp.; *Nectria badia* n. sp.; **Uropolystigma** (n. gen. Nectriaceae) *atro-testaceum* n. sp.; *Calonectria coralloides* n. sp.; *Giberella longispora* n. sp.; *Asterina Maublancii* (Arnaud) nob.; *Dimerosporium Triumfettae* Arn.; *Maublancia Myrtacearum* Arn.; *Morenonia inaequalis* Maubl.; *Pestalozzia paraguariensis* n. sp.; *Cercospora Byrsonimatis* n. sp.; *Cercospora ilicicola* n. sp.; *Cercospora Trigonellae* n. sp.; *Gibellula arachnophila* (Ditm.) Vuill. forma *macropus n. f.*—*D. S. Welch.*

1225. Mayor, Eugene. **Étude experimentale du Puccinia Opizii Bubak. [On Puccinia Opizii Bubak.]** Bull. Trimest. Soc. Mycol. France **36**: 97–100. 1920.—Experiments verify the results of Bubak, Tranzschel, and Arthur, and demonstrate that *Puccinia Opizii* is able to develop aecidia on the following composites: *Lactuca canadensis*, *L. muralis*, *L. perennis*, *L. sativa*, *L. scariola*, *L. virosa*, *Crepis biennis*, *C. taraxacifolia*, *C. virens*, *Lampsana communis*, *Sonchus arvensis*, *S. asper*, *S. oleraceus*. Uredo- and teleutospores develop on *Carex muricata* and *C. siccata* in the U. S. A. The following composites were found to be immune: *Aposeris foetida*, *Centaurea Jacea*, *C. Rhapontieum*, *Crepis aurea*, *C. blattarioides*, *C. foetida*, *C. mollis*, *C. paludosa*, *Cirsium palustra*, *Erigeron acer*, *Hypochoeris radicata*, *Senecio aquaticus*, *S. Jacobaea*, *S. Fuchsii*, *S. silvaticus*, *Taraxacum officinale*.—*D. S. Welch.*

1226. Mirande, Robert. **Zoophagus insidians Sommerstoff, capteur de rotifèrs vivants. [A captor of living rotifers, Zoophagus insidians.]** Bull. Trimest. Soc. Mycol. France **36**: 47–53. *5 fig.* 1920.—This organism, probably a member of the Saprolegniaceae, is parasitic upon certain aquatic animals, especially rotifers. Short branches of the filaments apparently produce an adhesive substance at the tip. These tips come in contact with the oral cavity of animals seeking food; the animal is effectively caught. The fungus develops abundantly within the body of the animal killing and digesting it, only the chitinous parts remaining. Only one other case is known, that of *Arthrobotrys oligospora* (Zopf), of a fungus able to capture living animals of a relatively higher organization.—*D. S. Welch.*

1227. Moreau, F. **A propos du noveau genre Kunkelia Arthur. [A propos of the new genus Kunkelia of Arthur.]** Bull. Trimest. Soc. Mycol. France **36**: 101–103. 1920.—Attention is

called to the recent work of Arthur establishing the new genus *Kunkelia* on the short-cycled rust occurring on *Rubus* in a form similar to *Caeoma nitens*. The geographical distribution of this form is contrasted with that of the long-cycled form, *Gymnoconia interstitialis* (Schlecht.) Lagerheim. The latter is found in colder regions and at higher altitudes. These results are in accord with the theory of M. and Mme. Moreau that the short-cycled Uredineae have been derived from those of a longer life-cycle by the loss of the resting spore stage following emigration to a warmer climate.—*D. S. Welch.*

1228. PARISI, ROSA. **Di alcuni parassiti delle piante medicinali e da essenze. [Some parasites of medicinal and essence-producing plants.]** Riv. Patol. Veg. **11**: 1–16. 1921.—Ten fungous parasites are listed and described of which 2 are new species, namely, *Macrosporium Papaveris* on the capsules of *Papaver somniferum* and *Macrosporium Cavarae* on the foliage of *Ricinus communis*. *Septoria Melissae* Desmazières is transferred to the genus *Phleospora*.—*F. M. Blodgett.*

1229. PATOUILLARD, N. **Le genre Clavariopsis Holt. [The genus Clavariopsis.]** Bull. Trimest. Soc. Mycol. France **36**: 61–63. *2 fig.* 1920.—This genus was established by Holtermann for the Clavaria-like species of the genus *Tremella*. Three species are listed: *C. pinguis* Holt. type, from Java; *Tremella damaecornis* Moller from Brazil; *C. pulchella* Pat. and Har. from New Caledonia. A new species, *C. prolifera*, is described from the Philippines.—*D. S. Welch.*

1230. PATOUILLARD, N. **Quelques champignons du Tonkin (suite) (1). [Some fungi of Tonquin.]** Bull. Trimest. Soc. Mycol. France **36**: 174–177. 1920.—Fifteen species are described, of which the following are new: *Septobasidium carbonaceum, Helicobasidium purpureum* (Tul.) Pat. var. *orientale, Spongipellis Eberhardti,* and *Sphaerella Mycopron.*—*D. S. Welch.*

1231. PEARSON, A. A. **New British Hymenomycetes.** Trans. British Mycol. Soc. **7**: 55–58. 1921.—Besides descriptive notes on 8 other species, 1 new variety, *Hypochnus roseogriseus* Wakef. & Pearson var. *lavandulaceus,* is included.—*W. B. McDougall.*

1232. PETCH, T. **Presidential address. Fungi parasitic on scale insects.** Trans. British Mycol. Soc. **7**: 18–40. 1921.—The earliest record of a fungus parasitic on a scale insect was made in 1848 by Desmazières, who collected specimens in Normandy growing on scale insects on willow and ash. This fungus was a conidial form and was named *Microcera coccophila.* Later the perithecial stage was collected by Berkeley in America and named *Sphaerostilbe flammea* by the Tulasnes. Later 2 other species of *Sphaerostilbe* were shown to be parasitic on scale insects. In Europe all 3 species are rare and very poorly developed, especially in the Microcera stage, as compared with specimens collected in the tropics. The name *Microcera* has been used for any conidial fungus with Fusarium spores which grows on a scale insect, but there are 2 common types which differ from each other generically. One of these, the true *Microcera,* falls in the Stilbaceae. The other belongs to the Tuberculariaceae, and for this the author proposes to establish a new genus, **Pseudomicrocera.** A 3rd type which proved to be neither *Microcera* nor *Pseudomicrocera* was collected in 1904 in Australia by McAlpine. For this the author proposes a new genus, **Discofusarium.** A new genus name, **Podonectria,** is proposed for 3 species of scale insect fungi which are characterized by the possession of multiseptate ascospores and a Tetracrium conidial stage. In the genera *Cordyceps* and *Torrubiella* the number of species recorded as occurring on scale insects is comparatively small, respectively 3 and 4, and very little is known about some of them. All species of *Aschersonia* are entomogenous and occur for the most part on scale insects. The perithecial stage of *Aschersonia* is *Hypocrella* and it also is entomogenous. One species of *Empusa* and several of *Septobasidium* are known to occur on scale insects. Some species of *Septobasidium* after destroying the scale insects become parasitic on the host plant. Several species of Hyphomycetes have been recorded as parasitic on scale insects. About 10 species of endoparasites of scale insects have been described, mostly belonging to the Saccharomycetes.

Entomogenous fungi destroy enormous numbers of scale insects and for this reason numerous attempts have been made, notably in Florida, to control scale insect pests by means of these fungi. After 30 years trial, however, "there is no instance of the successful control of any insect by means of fungus parasites." [See also following entry.]—*W. B. McDougall.*

1233. Petch, T. **Studies in entomogenous fungi. 1. The Nectriae parasitic on scale insects.** Trans. British Mycol. Soc. **7**: 89–132. 1921.—This paper is to be continued in the next part of the Transactions. The present installment includes a historical summary and an account of the genus *Microcera*, of a new genus, **Pseudomicrocera**, and of the genus *Sphaerostilbe*. [See also preceding entry.]—*W. B. McDougall.*

1234. Peyronel, B. **La forma ascofora della Rhacodiella castaneae, agente del nerume delle castagne. [The ascospore form of Rhacodiella castaneae, cause of the black rot of chestnuts.]** Atti R. Accad. Lincei Roma Rendiconti (Cl. Sci. Fis. Mat. e Nat.) **29**²: 324–327. 1920. —The perfect stage of *Rhacodiella castaneae* proved to belong in the genus *Sclerotinia* and was classified provisionally as *S. pseudotuberosa* Rehm. A description is given.—*F. M. Blodgett.*

1235. Ramsbottom, J. **Californian bees.** Trans. British Mycol. Soc. **7**: 86–88. 1921.—"Californian bees" is one of several local names for the ginger-beer plant, which is made up of 2 organisms, a yeast, *Saccharomyces pyriformis*, and a bacterium, *Bacterium vermiforme*, living together symbiotically. It is considered probable that both organisms are benefited by the symbiosis, the bacterium obtaining metabolic substances given off by the yeast cells and the yeast benefited by removal of these same substances.—*W. B. McDougall.*

1236. Ramsbottom, J. **The Minehead foray.** Trans. British Mycol. Soc. **7**: 1–10. 1921. —The 24th annual meeting and autumn fungus foray which took place at Minehead, Oct, 2, 1920, are reported and a complete list of the fungi collected, numbering about 530 species is given.—*W. B. McDougall.*

1237. Rea, Carleton. **New or rare British Discomycetes.** Trans. British Mycol. Soc. **7**: 58–61. 1921.—Besides descriptive notes on 5 other species, *Pustularia lecithina* (Cke.) is included as a new combination and *Niptera Taxi* is described as new.—*W. B. McDougall.*

1238. Saccardo, P. A. **Fungi Sinensis aliquot a cl. Prof. Otto A. Reinking collecti et communicati. [Some Chinese fungi collected and arranged by Prof. Otto A. Reinking.]** Philippine Jour. Sci. **18**: 595–605. 1921.

1239. Saccardo, P. A. **Micetes Boreali Americani. [North American fungi.]** Nuovo Gior. Bot. Ital. **27**: 72–88. 1920.—A list is given of fungi collected by J. R. Weir.—*Ernst Artschwager.*

1240. Snell, Walter H. **Chlamydospores of Fomes officinalis in nature.** Phytopathology **11**: 173–174. *Fig. 1.* 1921.—Chlamydospores, similar to those produced in cultures, were found on specimens of wood decomposed by *Fomes officinalis*. Attempts to germinate the chlamydospores failed.—*B. B. Higgins.*

1241. Vuillemin, Paul. **Nouvelles souches thermophiles d'Aspergillus glaucus. [Thermophilic forms of Aspergillus.]** Bull. Trimest. Soc. Mycol. France **36**: 127–136. *Fig. 1–3.* 1920.—Strains of *Aspergillus* have been found capable of growing at a maximum temperature of 38°C. Two of these, *Eurotium Amstelodami* and *E. Chevalieri*, were described as new species by Mangin. Cultural studies have been made upon pathogenic forms of *Aspergillus* from which the author concludes that the above mentioned species are but varieties of *Eurotium repens*. He suggests the following names: *Eurotium repens* var. *Amstelodami* and *E. repens* var. *Chevalieri*.—*D. S. Welch.*

1242. Wainio, E. A. **Lichenes Insularum Philippinarum III.** Ann. Acad. Sci. Fennicae **15**: 1–368. 1921.—Two genera of fungi are described, **Melaspileela** (Karst.) Wainio, with 2

species, 1 being new, and Didymosphaeria Sacc., with 3 new species. [For abstract of entire paper see Bot. Absts. 10, Entry 1249.]—*H. M. Fitzpatrick.*

1243. Whitehead, T. **On the life history and morphology of Urocystis cepulae.** Trans. British Mycol. Soc. 7: 65–71. *Pl. 2.* 1921.—*Urocystis cepulae*, which causes a destructive smut disease of onions, has a relatively simple life history, chlamydospores giving rise to promycelia which develop sporidia laterally. Infection probably takes place through root hairs in the collar region of seedlings.—*W. B. McDougall.*

1244. Wilson, Malcolm. **Notes on new or rare British fungi.** Trans. British Mycol. Soc. 7: 79–85. 1921.—This paper contains notes on *Dasyscypha calyciformis* (Willd.) Rehm, *Hypoderma pinicola* Brunch, *Hypoderma brachysporum* (Rostr.) Tub., *Cronartium ribicola* F. de Waldh., *Melampsorella caryophyllacearum* Schröt., *Hapalosphaeria deformans* Syd., *Melasmia empetri* Magn., *Botrytis douglasii* Tub., and seven species of *Puccinia.*—*W. B. McDougall.*

LICHENS

1245. Knight, H. H. **The lichens of Minehead district.** Trans. British Mycol. Soc. 7: 16–18. 1921.—A list is given of about 146 species of lichens collected in the vicinity of Minehead, Somersetshire, during the autumn foray of 1920. Three fungus parasites on lichens were found.—*W. B. McDougall.*

1246. Mereschkovsky, C. **Diagnoses of some lichens.** Ann. and Mag. Nat. Hist. 8: 246–290. *Fig. 1–2.* 1921.—The author gives Latin diagnoses of a large number of lichens which he has previously described in Russian and French. In some cases the descriptions are brief, the collections and notes having been left in Russia. Some corrections are made to his preceding paper (see Bot. Absts. 8, Entry 479).—*H. H. Clum.*

1247. Paulson, Robert. **The sporulation of gonidia in the thallus of Evernia prunastri Ach.** Trans. British Mycol. Soc. 7: 41–47. *Pl. 1.* 1921.—"The gonidium does not multiply vegetatively as a constituent of the lichen thallus, but the original protoplast of the mother cell divides into 2, 4, 8, or 16—sometimes more—distinctly separate wall-less masses. Each of these masses rapidly secretes a cell-wall, develops a chloroplast and nucleus and, in a short time, resembles exactly, in miniature, the mother cell as it appeared before it commenced to sporulate. The mother cell-wall, either by becoming difluent or by bursting, sets free the daughter cells."—*W. B. McDougall.*

1248. Paulson, Robert. **The microscopical structure of lichens.** Jour. Quekett Microsc. Club 14:163–170. *Pl. 4, fig. 1–2.* 1920.—The gonidia of most lichens belong to a species of *Chlorella*, the cells of which do not divide vegetatively but reproduce by sporulation within the algal mother cell, much as in free *Chlorella* cells. "Penetration of living gonidia by hyphae seldom, if ever, takes place."—*L. B. Walker.*

1249. Wainio, E. A. **Lichenes Insularum Philippinarum III.** Ann. Acad. Sci. Fennicae 15: 1–368. 1921.—This is the 3rd and concluding paper of the series, the first 2 having been published in the Philippine Jour. Sci. Bot. 4: 651–662. 1909, and 8: 99–137. 1913.—The series is largely based on the material collected by the Bureau of Science [P. I.], supplemented by some specimens secured by Elmer and Baker. Sixty-four genera containing 514 species, besides many varieties and forms, are described in the present work, of which 11 genera and 364 species as well as a great many varieties, are offered as new to science. This makes a total of 87 genera and 635 species listed by Wainio in his 3 papers on Philippine lichens. No attempt has yet been made to collect rock lichens, which are very conspicuous in many localities. Following is a list of the genera described, with the number of new species and total number of species described in each: *Arthonia* (Ach.) Wainio, 29 species (21 new); *Aspidopyrenium* Wainio, 2 species (1 new); *Asterothyrium* Müll.-Arg., 4 species, all new; *Bacidia* De Notaris, 17 species, all new; *Baeomyces* (Pers.) Mass., 7 species (2 new); *Biatorella* De Notaris, 2 species

(new); *Bilimbia* De Notaris, 14 species, all new; *Bombyliospora* Mass., 3 species; *Bottaria* (Mass.) Wainio, 13 species (9 new); **Byssolecania** Wainio, new genus with 2 species (new); *Calenia* Müll.-Arg., 7 species (6 new); *Calicium* Persoon, 1 species (new); *Catillaria* (Mass.) Wainio, 9 species (8 new); *Chiodecton* (Ach.) Wainio, 20 species (13 new); *Cladonia* (Hill) Weber, 15 species (1 new); *Coccocarpia* Persoon, 5 species (1 new); *Coenogonium* Ehrenb., 5 species (1 new); *Collema* (Hill) Fr., 4 species (1 new); *Crocynia* (Ach.) Nyl., 2 species (new); **Cyclographa** Wainio, new genus with 1 species (new); *Dendriscocaulon* Nyl., 1 species; *Diploschistes* Norman, 1 species; *Ectolechia* Trevis., 1 species; *Erioderma* Fée, 2 species; *Graphis* (Adans.) Nyl., 107 species (79 new); *Gyalecta* (Ach.) Wainio, 8 species (5 new); *Gyrostomum* Fries., 1 species; *Haplopyrenula* Müll.-Arg., 4 species (3 new); *Heppia* Naegeli, 1 species; *Lecaniella* Wainio, 1 species (new); *Lecidea* (Ach.) Th. Fr., 33 species (30 new); *Leptodendriscum* Wainio, 1 species; *Leptogium* (Ach.) Gray, 15 species (6 new); **Megalopsora** Wainio, new genus with 1 species (new); *Melaspilea* Nyl., 2 species (new); **Micropyrenula** Wainio, new genus with 1 species (new); *Microthelia* (Koerb.) Müll.-Arg. 1 species; **Mycopegrapha** Wainio, new genus with 1 species (new); *Opegrapha* (Humb.) Wainio, 17 species (10 new); *Pannaria* Delise, 13 species (7 new); *Parmeliella* (Müll.-Arg.) Wainio, 3 species; **Phylloblastia** Wainio, new genus with 1 species (new); **Phyllobrassia** Wainio, new genus with 1 species; *Physcidia* Tuck., 1 species; *Physma* Mass., 4 species (2 new); *Pilocarpon* Wainio, 5 species (4 new); *Polyblastia* (Mass.) Lonnr., 1 species (new); *Porina* (Ach.) Wainio, 20 species (17 new); *Psoroma* (Fr.) Nyl., 1 species; *Pseudopyrenula* (Müll-Arg.) Wainio, 4 species (new); *Pyrenula* (Fée) Wainio, 33 species (29 new); **Rhodothrix** Wainio, new genus with 1 species (new); **Semigyalecta** Wainio, new genus with 1 species (new); *Sphaerophorus* Persoon, 2 species; *Sporopodium* Montagne, 18 species (15 new); *Thalloedaema* (Mass.) Wainio, 1 species; *Thelenella* (Nyl.) Wainio, 3 species (new); **Thelidiopsis** Wainio, new genus with 1 species (new); *Thelotrema* (Ach.) Eschw., 30 species (24 new); *Toninia* Mass., 2 species (new); *Tricharia* (Fée) Wainio, 1 species; *Trichobacidia* Wainio, 1 species (new); *Trichothelium* Müll.-Arg., 3 species (new). In addition to the above, 2 genera of fungi are described: **Melaspileela** (Karst.) Wainio, with 2 species (1 new), and Didymosphaeria Sacc., with 3 new species.—An analysis of the Philippine lichen flora studied by Wainio shows that the tribe Graphideae, which reaches its maximum development in the tropics, furnishes 178 species, or over 28 per cent of the total number. The genus *Graphis*, with 107 species, is by far the most characteristic group, and this would still be true if the subgenera were to be elevated to generic rank. It is not likely that *Graphis* will be displaced from its dominant position by further discoveries though great alterations may be expected in the relative positions of some of the genera when the rock-dwelling lichens are collected and studied.—*Albert W. C. T. Herre.*

BACTERIA

1250. AYERS, S. H., P. RUPP, AND C. S. MUDGE. **The production of ammonia and carbon dioxide by streptococci.** Jour. Infect. Diseases **29**: 235–260. 1921.—By the use of ammonia and carbon dioxide tests, the streptococci are divided into 4 groups: (1) Those producing no ammonia and no carbon dioxide from peptone; (2) those producing both ammonia and carbon dioxide from peptone; (3) those producing no ammonia, but forming carbon dioxide from dextrose; (4) those producing no ammonia but forming carbon dioxide, which does not come from peptone or dextrose. Ammonia can be readily determined colorimetrically. For testing carbon dioxide production the Eldredge fermentation tube is recommended.—*Selman A. Waksman.*

1251. BEWLEY, W. F., AND H. B. HUTCHINSON. **On the changes through which the nodule organism (Ps. radicicola) passes under cultural conditions.** Jour. Agric. Sci. **10**: 144–162. *Pl. 1–2, fig. 1.* 1920.—While the portion of the life cycle of *Pseudomonas radicicola* confined to the nodules is fairly well known, little is known of it in the soil. The morphological changes occurring in nodules have not been reproduced in vitro and little is known concerning the chemical processes in the nodule. The authors employ various media containing soil extract, various salts, and carbohydrates. Nodule organisms from roots of red clover, broad bean, lucerne, and lupine were used and a definite life cycle was obtained. In neutral soil solution or

when the carbohydrate supply is exhausted, a small, non-motile, coccus form appears which is designated as the "non-motile, pre-swarmer stage." In the presence of saccarose, certain other carbohydrates, and phosphates the coccoid form increases in size to double its former diameter, but still remains non-motile. This is the "second pre-swarmer" stage. The "second pre-swarmer" now becomes ellipsoidal and develops high motility. This is the well known "swarmer" of Beijerinck. The organism in the "swarmer" stage now becomes more elongated, assuming a definite rod form and still remaining motile, though less so. The organism remains in this form as long as the medium contains sufficient available carbohydrate. When the organism is placed in neutral soil extract or when the available carbohydrate supply becomes exhausted it becomes highly vacuolated and the chromatin divides into a number of bands. These bands finally become rounded off and escape from the rod as the coccoid "pre-swarmers." The addition of calcium or magnesium to the medium or anaerobic conditions induce the "pre-swarmer" stage. The reaction of the soil has an important effect on the organism. The "pre-swarmer" stage is rapidly produced in calcareous soils, while in acid soils the cells become highly vacuolated and ultimately die. Slightly alkaline soils are capable of supporting vigorous growth without altering the form of the cells. High temperatures (30–37°C.) either prevent or postpone the breaking up of the rod forms.—*V. H. Young.*

1252. Donk, P. J. **A highly resistant thermophilic organism.** Jour. Bact. 5: 373–374. 1920.—A description is given of a bacterium isolated from canned corn which is very resistant to high temperatures; the author proposes the name *Bacillus stearothermophilus.*—*Chester A. Darling.*

1253. Esty, J. Russell. **The biology of Clostridium Welchii.** Jour. Bact. 5: 375–429. 1920.—Over 100 strains of *Clostridium Welchii* (*Bacillus aerogenes capsulatus*) were isolated from various sources and subjected to a rather complete series of tests; the study is arranged under the following headings: Isolation, distribution, morphology, spore formation, cultural characters, chemical characters, classification, thermal death point, pathogenicity, immunity, effects of feeding *Clostridium Welchii*, and conclusions.—*Chester A. Darling.*

1254. Hall, Ivan C. **Impure and misnamed stock cultures of obligate anaerobes.** Proc. Soc. Exp. Biol. and Med. 18: 314–316. 1921.—Sources of contamination of stock cultures are discussed.—*M. M. Brooks.*

1255. Hall, Ivan C. **The early history of litmus in bacteriology.** Science 53: 388–389. 1921.—The article deals mainly with the correction of certain errors but contains a list of 9 references.—*C. J. Lyon.*

1256. Jones, Dan H. **Further studies on the growth cycle of Azotobacter.** Jour. Bact. 5: 325–342. *Pl. 1–4.* 1920.—A review is given of some previous work done by the author on *Azotobacter*, followed by a consideration of the work and conclusions of Löhnis and Smith on "Life Cycles of the Bacteria" (Jour. Agric. Res. 6: 675–702. 1916.) The writer concludes from his observations that no endospores are formed in the 4 species which he studied; a symplastic stage occurs in which the individual cells are indistinguishable but numerous gonidia-like granules are present, being liberated when the cells disintegrate; these granules are reproductive bodies. The writer does not accept the conclusions of Löhnis and Smith that 2 or more cells unite; he interprets these stages as stages in fission.—*Chester A. Darling.*

1257. Kendall, A. I., M. Cook, and M. Ryan. **Methods of isolation and cultivation of anaerobic bacteria.** Jour. Infect. Diseases 29: 227–234. 1921.—The present information concerning the group of anaerobic bacteria is regarded as untrustworthy because no precautions have been taken to obtain the organisms free from aerobic and particularly anaerobic contaminations. The Barber method for the isolation of single cell cultures is modified for the isolation of single spores of anaerobic bacteria. Brain and meat media are used for the cultivation of the organisms; for peptone medium, a modification of the Hall tube is used.—*Selman A. Waksman.*

1258. Pirotta, R. **Ulteriora ricerche sul bacilli radicali della Diplotaxis erucoides DC. [Further investigations on the bacilli on the roots of Diplotaxis erucoides DC.]** Atti R. Accad. Lincei Roma Rendiconti (Cl. Sci. Fis. Mat. e Nat.) 29²: 361–364. 1920.—Details of comparative cultural studies are given of 3 bacilli previously reported on *Diplotaxis erucoides*, showing that they act similarly on proteins and carbohydrates but with varying intensity.—*F. M. Blodgett.*

1259. Ramsbottom, J. **Californian bees.** Trans. British Mycol. Soc. 7: 86–88. 1921. —See Bot. Absts. 10, Entry 1235.

1260. Vierling, Karl. **Morphologische und physiologische Untersuchung über bodenbewohnende Mykobakterien. [Morphological and physiological investigation of soil-inhabiting mycobacteria.]** Centralbl. Bakt. II Abt. 52: 193–214. *Pl. 1.* 1920.—A detailed study is presented of a large number of soil-inhabiting mycobacteria. The growth and pigment production on potato was not found to be as luxuriant as is generally stated in the literature. The different color forms distinguished were red, white, yellow, and dirty yellow. Classification of these organisms is complicated by the existence of transition forms. The most variable character is color. Different strata of the same colony sometimes assume different colors, especially in old colonies. The author agrees with Lehmann and Neumann in separating the mycobacteria from the true bacteria and in placing them with the actinomyces. Multiplication by fission was not observed. Growth on solid and in liquid media is in the form of threads with monopodial branching. These threads break up readily, especially when allowed to dry on the cover glass, giving the appearance of bacillus and coccus forms. An important distinction between mycobacteria and ray fungi is the absence of aerial spores. The principal activity of these organisms in the soil seems to be in breaking down organized substances. The limited amount of quinones produced by certain strains may be of importance in this connection. The fact that the mycobacteria can utilize calcium nitrate makes it not unlikely that they take part in tbe dissociation of this artificial fertilizer. It is a significant fact that these organisms multiply rapidly in soils rich in humus.—*Anthony Berg.*

MYXOMYCETES

1261. Buchet, S., H. Chermezon, et F. Evrard. **Matériaux pour la flore française des Myxomycètes. [French Myxomycetes.]** Bull. Trimest. Soc. Mycol. France 36: 106–121. 1920.—This article constitutes the 2nd work published by these authors on the subject, the 1st having appeared in 1912. Lists from herbaria and exsiccati are given, including mostly forms not already listed in previous publication. Extensive collections of new specimens from all parts of France are listed. A total of 132 species is reported from France. A short bibliography is given.—*D. S. Welch.*

1262. Hadden, Norman G. **Mycetozoa at Porlock in October, 1920.** Trans. British Mycol. Soc. 7: 13–16. 1920.—During the first half of October the weather conditions were favorable for the fruiting of Myxomycetes on sawdust heaps while later in the month many interesting and some rare species were found on decaying logs, twigs, hedge clippings, and mosses. A number of species are discussed with reference to habitat and weather conditions.—*W. B. McDougall.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

(See also in this issue Entries 1089, 1094, 1188, 1392)

1263. Berry, Edward W. **Tertiary fossil plants from Venezuela.** Proc. U. S. Nation. Mus. 59: 553–579. *Pl. 107–109.* 1921.—Plants are described from beds in the foothills of the Sierra de Merida in Venezuela which are considered to be of Miocene age. New species are described in the genera *Blechnum*, *Sabalites*, *Coussapoa*, *Ficus*, *Anona*, *Simaruba*, *Rhizo-*

phora, *Leguminosites*, *Sophora*, *Antholithus*, *Apocynophyllum*, and *Burserites*. Species of *Heliconia* and *Trigonia*, previously known from the Miocene of Colombia, are recorded, and the seed of a fossil species of *Entada* is described.—*E. W. Berry.*

1264. CHANEY, R. W. **A fossil flora of the Puente formation of the Monterey group.** Amer. Jour. Sci. 2: 90–92. 1921.—About 18 species, 2 of which are marine algae and the remainder terrestrial plants, are recorded from the Miocene diatomaceous shales of southern California. They are said to indicate a climate much like that of the present in the same region, and consist largely of moist woodland and stream border plants, probably transported by streams to their resting place in the marine sediments of shallow coastal waters.—*E. W. Berry.*

1265. GOTHAN, W., UND K. NAGEL. **Über einen cedroiden Coniferenzapfen aus dem Unter-Eocän der Greifswalder Oie.** [**On a cedar cone from the lower Eocene of Greifswalder Oie.**] Jahrb. Preuss. Geol. Landesanstalt 41: 121–131. *Pl. 8.* 1920.—A well preserved phosphatized cone from the lower Eocene (Ypresian stage) of north Germany is described under the name of Apterostrobus *cedroides*. Minor differences are pointed out which distinguish it from the modern *Cedrus*.—*E. W. Berry.*

1266. JESSEN, KNUD. **Moseundersøgelser i det nordøstlige Sjaelland. Med Bemaerkninger om Traeers og Buskes Indvandring og Vegetationes Historie.** [**Bog investigations in northeast Sjaelland, with remarks on the immigration of trees and shrubs and the history of the vegetation.**] Danmarks Geol. Undersøgelse 2^{34}: 1–269. 1920.—This work contains a summary of previous results in the study and interpretation of the late Glacial and post Glacial bogs; detailed accounts, both geologic and ecologic, of the Danish bogs; lists of animals and plants found; and an account of the time of immigration and the subsequent history in Denmark of a large number of trees and shrubs. The pollen-statistical method is largely used and frequency curves are constructed for the different species. The results appear to point to the validity of the so-called Blytt-Sernander hypothesis of past alternations of climate. This study starts with late Glacial times, considered, on the basis of the geological work of DeGeer and Lidén, to have been about 11000 B. C. or slightly earlier. This was the time of the Older Dryas flora of *Dryas octopetala*, *Salix polaris*, *Salix reticulata*, *Betula nana*, etc., indicating a subarctic climate in Denmark with July temperatures of 8–12°C. This was followed by the Allerod period, marked by the introduction of *Betula intermedia*, *B. pubescens*, *Juniperus communis*, *Pinus silvestris*, *Populus tremula*, etc., indicating a temperate continental climate with July temperatures of 12–15°C. The Allerod period was followed by the Younger Dryas Period, with a recurrence of the climate and flora of the Older Dryas Period. Following this was a long warm period estimated as having lasted for about 7000 years, commencing about 7500 B. C., during which the climate in that region was warmer than at present. This warm period, which corresponds to the Ancylus Lake and the Litorina sea in the history of the Baltic, is divided into (1) an older Mullerup, Pine, or Boreal Period, during which the climate was dry and rather warm, with such plants as *Alnus glutinosa*, *Tilia cordata*, *Ulmus glabra*, *Cornus sanguinea*, *Corylus avellana*, *Prunus padus*, *Pinus silvestris*, etc., and (2) a mixed oak forest or Atlantic Period during which the climate was warm and humid, with July temperatures of about 17°C. The plants included *Acer platanoides*, *Fraxinus excelsior*, *Humulus lupulus*, *Trapa natans*, and, toward the close of the period, *Fagus silvatica*. Then followed (3) the beginning of the Beech Period, about contemporaneous with the Bronze Age, at which time July temperatures reached 18°C. and the climate was again dry and warm. At about 400 B. C. the temperature lessened and the climate became more humid. This corresponds to the Limnaea Sea stage of the Baltic, or to the Iron Age in Denmark, and is known as the Sub-Atlantic Period. The latter continued to the beginning of the Historic Period, which, in Denmark, was about 800 A. D.—*E. W. Berry.*

1267. JOHNSON, T., AND J. G. GILMORE. **The occurrence of a Sequoia at Washing Bay.** Proc. Roy. Dublin Soc. 16: 345–352. *Pl. 13–14.* 1921.—The presence of *Sequoia Couttsiae* Heer in the upper Oligocene of Washing Bay, Ireland, is described, and from a microscopic study of the foliage its reference to the genus *Sequoia* is confirmed.—*E. W. Berry.*

1268. Johnson, T., and J. G. Gilmore. **The occurrence of Dewalquea in the coal bore at Washing Bay.** Proc. Roy. Dublin Soc. 16: 323–333. *Pl. 11–12.* 1921.—*Dewalquea hibernica* from the upper Oligocene of Washing Bay, Ireland, is described, together with the microscopic characters of the foliage. The author discusses the affinity of the genus and inclines to regard it a primitive member of the Juglandaceae.—*E. W. Berry.*

1269. Knowlton, F. H. **Criteria for determination of climate by means of fossil plants.** Bull. Geol. Soc. Amer. 32: 353–358. 1921.

1270. Knowlton, F. H. **Further remarks on the evolution of geologic climates.** Amer. Jour. Sci. 2: 187–196. 1921.—The author replies to criticisms and restates his conviction that throughout most of geologic time earth and not solar control was a dominant factor in terrestrial climates.—*E. W. Berry.*

1271. Moodie, Roy L. **Osteomyelitis in the Permian.** Science 53: 333. 1921.—The writer records infection by bacteria located in the spine of a reptile of the *Dimetrodon* type. —*C. J. Lyon.*

1272. Steinmann, G. **Rhatische Floren und Landverbindungen auf der Südhalbkugel. [Rhaetic floras and geography in the southern hemisphere.]** Geol. Rundschau 11: 350–354. *Fig. 1.* 1921.—The following fossil plants are recorded from the dark shales of Biobio in southern Chile: *Pecopteris (Asterotheca) Cottoni* Zeiller, *Cladophlebis Roesserti* Presl, *Cladophlebis australis* Morris, *Thinnfeldia* c.f. *rhomboidalis* Ett., c.f. *T. odontopteroides* Morris, *Clathropteris platyphylla* Goepp., c.f. *Podozamites distans* Presl. These are considered as indicating a Rhaetic age and denoting some land connection at that time with Australia and New Zealand.—*E. W. Berry.*

PATHOLOGY

G. H. Coons, *Editor*
C. W. Bennett, *Assistant Editor*

(See also in this issue Entries 911, 917, 922, 930, 1019, 1020, 1099, 1117, 1143, 1167, 1201, 1203, 1212, 1217, 1218, 1228, 1232, 1243, 1245, 1253)

PLANT DISEASE SURVEY; REPORTS OF DISEASE OCCURRENCE AND SEVERITY

1273. Arthur, J. C. **Origin of potato rust.** Science 53: 228–229. 1921.—The potato rust (*Puccinia pitteriana,* also found on tomatoes), mentioned by the writer in a short paper in Science (see Bot. Absts. 7, Entry 1127) was still occurring in Ecuador in 1919. It has not yet entered the U. S. A. Evidence is given in support of the theory that this rust has originated "somewhere between Ecuador and Costa Rica on hosts native to the locality."—*C. J. Lyon.*

1274. Chipp, T. F. **Another wet-rot and Poria hypobrunnea.** Gardens' Bull. Straits Settlements 2: 429–432. 1921.—This is an account of *Poria hypobrunnea* on *Hevea brasiliensis* in the Malay Peninsula, and a record of the occurrence of a similar fungus in Singapore upon *Spathodea companulata.*—*I. H. Burkill.*

1275. Cockayne, A. H. **Powdery scab in potatoes.** New Zealand Jour. Agric. 21: 169–174. *Pl. 1.* 1921.—Australia has declared a quarantine against potatoes from New Zealand on account of powdery scab (*Spongospora subterranea*). This disease is very common in some sections of New Zealand, but it does not appear to be destructive to the crop. Powdery scab is not known to occur in Australia. The distribution and characteristic appearance of the disease are given.—*N. J. Giddings.*

1276. Lee, H. Atherton, and Mariano G. Medalla. **Leaf stripe disease of sugar cane in the Philippines.** Science 54: 274–275. 1921.—It is thought that the sugar cane downy

mildew, *Sclerospora sacchari*, has been imported into the Philippines from Formosa. All possible measures have been taken to eradicate the disease.—*C. J. Lyon.*

1277. MOIR, W. STUART. **Recent observations on American white pines in Europe.** Amer. Plant Pest Committee Bull. 6: 7. [1921?]—In Norway, Sweden, and Denmark white pine (*Pinus strobus*) is no longer considered a profitable tree because of the ravages of blister rust. Gooseberries and currants, especially black currants, are very plentiful, and no attempts are made to control the rust by eradicating these alternate hosts. White pine is being replaced by Douglas fir and Sitka spruce. In Belgium cultivation of white pine has been abandoned because of the destructiveness of the rust. In France the disease is not considered particularly destructive. However, the author found a large percentage of the regeneration attacked and mature trees killed. Observations made in Europe on the susceptibility of sugar pine, western white pine, and limber pine show that these species are as readily attacked and as severely damaged as the eastern American white pine.—*W. H. Rankin.*

1278. REINKING, OTTO A. **Fiji disease of cane.** Facts about Sugar 12: 272–273. 1921. [Reprinted from Sugar Central and Planters News (Manila) 1: 16–20. 1920.]—This article includes a description of the Fiji disease of sugar cane and a warning as to the danger involved in shipping cane from the Fiji Islands.—*C. W. Edgerton.*

1279. SOUTH, F. W. **Certain host plants of Fomes lignosus and Ustulina zonata.** Agric. Bull. Federated Malay States 8: 242–243. 1920 [1921].—Bamboos in a plantation of *Hevea brasiliensis* showed infection with *Fomes lignosus*, and it appeared possible that the fungus exists also upon tubers of sweet potato, *Ipomoea Batatas*. *Ustulina zonata* was found on *Areca catechu*.—*I. H. Burkill.*

1280. STONE, R. E. **The strawberry troubles of 1921.** Canadian Hort. 44: 110–124. 1921.—Winter injury was very prevalent in the Niagara Peninsula, Ontario, due mainly to late, hard frosts after growth had well started. Leaf spot (*Mycosphaerella fragariae*) and leaf scorch (*Mollisia earliana*) were also destructive, due to weather favorable for the spread of these diseases during April and May. Prevention and remedies include planting only strong, vigorous sets on well drained soil, winter mulching, and spraying with Bordeaux mixture.—*E. F. Palmer.*

THE PATHOGENE (BIOLOGY; INFECTION PHENOMENA; DISPERSAL)

1281. BUGNON, P. **Sur un mode d'attaque et de contamination parasitaires des feuilles de lierre (Hedera Helix L.) déterminé par la pluie.** [**On infection of leaves of the ivy determined by rain.**] Bull. Trimest. Soc. Mycol. France 36: 172–174. *1 fig.* 1920.—Ivy leaves were observed bearing diseased areas on the lower edges. The parasite appears to be *Phyllosticta hedericola*. It is concluded that infection is brought about by rain water remaining on the lower edges of the leaves and producing conditions favorable for germination of the spores and infection of the host. It is suggested that if such is the case the configuration of the spots, although mentioned in classical diagnoses, is of little value as a specific character.—*D. S. Welch.*

1282. FRASER, W. P., AND D. L. BAILEY. **Biologic forms of wheat stem rust in western Canada.** Phytopathology 11: 202. 1921.—Four distinct biologic forms of stem rust (*Puccinia graminis*), identical with forms isolated by Stakman, have been found in western Canada.—*B. B. Higgins.*

1283. NEWTON, MARGARET. **Biologic forms of wheat stem rust in western Canada.** [Abstract.] Phytopathology 11: 202. 1921.—Five biologic forms of stem rust (*Puccinia graminis*), identical with forms isolated by Stakman, have been found in western Canada.—*B. B. Higgins.*

1284. Roberts, John W. **The age of brown-rot mummies and the production of apothecia.** Phytopathology 11: 176–177. 1921.—Mummies of both peaches and plums decayed during the summer by *Sclerotinia cinerea* produced apothecia the following spring.—*B. B. Higgins.*

THE HOST (RESISTANCE; SUSCEPTIBILITY; MORBID ANATOMY AND PHYSIOLOGY)

1285. Allen, Ruth F. **Resistance to stem rust in Kanred wheat.** Science 53: 575–576. 1921.—A cytological study of *Puccinia graminis tritici* showed that when the urediniospores germinate, the germ tubes form appressoria at the opening of the leaf stomata. With Kanred wheat, only 10 per cent of rust inoculations were effective, though the appressoria were numerous. Measurement of stomatal slits in Kanred and Mindum wheats (the latter a less resistant type) showed that the openings in the Kanred variety are extremely long and narrow and those of the less resistant type are short and twice as wide.—*C. J. Lyon.*

1286. Fortún, G. M., y S. C. Bruner. **Investigaciones sobre la enfermedad del "mosaico" o "rayas amarillas" de la caña de azúcar.** [Investigations on the mosaic of sugar cane.] Rev. Agric. Com. y Trab. [Cuba] 3: 441–445. *1 fig.* 1921.—Fifty-two varieties of healthy sugar cane were planted in rows adjacent to mosaic sugar cane. At the end of 5 months all the varieties except the Uba, Japonesa, and Cayana, were more or less diseased. Tables are given showing the rate of infection and the total number of healthy and diseased stocks in each variety at the end of the experiment.—*F. M. Blodgett.*

1287. Lee, H. Atherton. **The relation of stocks to mottled leaf of citrus trees.** Philippine Jour. Sci. 18: 85–93. *Pl. 1–3.* 1921.—Experiments in the Philippines demonstrated that trees upon pumelo stock were badly affected with mottled leaf, while those on mandarin orange and calamondin stock were unaffected under the same conditions. The relationship of stock is not advanced as a cause of the disease, but the use of certain stocks is believed to predispose to the disease when the causal factors are present.—*Albert R. Sweetser.*

1288. Pantanelli, E. **Sui rapporti fra nutrizione e recettività per la ruggine.** [On the relation between nutrition and receptivity to rusts.] Riv. Patol. Veg. 11: 36–54. 1921.—Pot and water cultures of wheat, oats, corn, and beans were grown with different nutrients to determine their respective receptivity to *Puccinia glumarum tritici*, *P. coronata*, *P. sorghi*, and *Uromyces fabea.* Special attention was paid to nutrition, activity of the roots, and composition of foliage at the time of attack. In general the better growing and better nourished plants were more receptive. An excess of phosphate in relation to nitrogen increases resistance only when it checks growth, whereas a phosphate nutrition proportional to the nitrogen nutrition and resulting in a regular growth has no influence on receptivity. Increased concentration of the liquid around the roots diminishes receptivity because it depresses the absorbent activity of the roots, not because it increases the osmotic pressure of the cell sap in the foliage; the latter does not appear to have a relation to receptivity. Probably the concentration of the organic substances of the sap is of importance, and it appears that the more the free acids increase in relation to the basic molecules, the greater the resistance. The most receptive organs are richest in sugars, in acids with large molecules, and in soluble compounds of phosphorus and nitrogen.—*F. M. Blodgett.*

1289. Pinelle, J. **Dégats causés à la végétation par les usines.** [**Damage to vegetation caused by factories.**] Jour. Soc. Nation. Hort. France 22: 50–51. 1921.—This is an account of injury to vegetation by cement dust. The scientific committee of the National Society of Horticulture of France advised that dust from the cement plant killed the plants by covering the leaves and checking respiration and transpiration. Legal action resulted in judgment against the factory.—*H. C. Thompson.*

DESCRIPTIVE PLANT PATHOLOGY

1290. Brock, J. A. **Diseases of sugar beets.** Facts about Sugar 12: 470–471. 1921.—This is a short description of the different diseases of sugar beets.—*C. W. Edgerton.*

1291. Cook, Mel. T. [Rev. of: Stevens, F. L. **Diseases of economic plants.** Macmillan and Company: New York, 1921.] Science 53: 502–503. 1921.

1292. Dickson, B. T. **Studies on mosaic.** [Abstract.] Phytopathology 11: 202. 1921. —This includes a general discussion of mosaic diseases and notes on certain ones found in Quebec.—*B. B. Higgins.*

1293. Edgerton, C. W., and C. C. Moreland. **Eggplant blight.** Louisiana Agric. Exp. Sta. Bull. 178. *44 p., 18 fig.* 1921.—The eggplant blight (*Phomopsis vexans*) reduces the yield in Louisiana 50–75 per cent. All parts of the host plant above ground during all stages of growth are affected. Leaf spot and fruit rot are the forms most commonly seen, but the disease also manifests itself as cankers on the stems, leaf fall, and damping off in the seed bed. The fungus lives from season to season on and in the seed and also upon old decaying parts of the host plant. There are 2 kinds of spores, both borne in somewhat variable pycnidia. Normal period of incubation is 7–9 days. Injury to the epidermis is not necessary for infection. Different eggplant varieties do not show equal susceptibility. Spraying is successful only when the plants are kept covered with the fungicide, which requires 10–12 sprayings in Louisiana. Control measures advocated include clean seed, rotation, strong plants for transplanting to the field, and the use of the most resistant varieties.—*C. W. Edgerton.*

1294. McCulloch, Lucia. **A bacterial disease of gladiolus.** Science 54: 115–116. 1921. —The disease affects the leaves, often only the lower ones, forming circular to elliptical lesions which are rusty red in color, becoming dull brown to purplish; in time the leaves collapse. The disease, which spreads rapidly only in warm and moist weather, has been found in the District of Columbia, Illinois, and possibly in California. The causal organism, *Bacterium marginatum* n. sp., is described, cultural characteristics being given; its group number is 211.2222022. The organism is resistant to cold but is killed at 52°C.—*C. J. Lyon.*

1295. Montemartini, L. **Un brusone dell'Aucuba japonica dovuto alla Pleospora infectoria Fuck.** **[A blight of the leaves of Aucuba japonica due to P. infectoria.]** Riv. Patol. Veg. 11: 33–35. 1921.—A fungus, causing a browning of the leaves of *Aucuba japonica* beginning at the tips and margins of the leaves, was found to correspond closely to *Pleospora infectoria;* but, because of the greater frequency of distichous asci, the smaller dimensions of the perithecia, and the new host, the variety name *aucubicola* is added. The imperfect stage corresponds to *Alternaria tenuis.*—*F. M. Blodgett.*

1296. Povah, Alfred H. W. **An attack of poplar canker following fire injury.** Phytopathology 11: 157–165. *Fig. 1–3.* 1921.—In a group of 70 poplar (*Populus grandidentata* and *P. tremuloides*) trees in a burned-over area, 50 became infected with *Cytospora chrysosperma.* Large cankers 1–10 feet long were produced on the trunks and branches, and approximately 3 months after the fire 27 of the trees had been girdled and killed. Pycnidia and spores were produced in great abundance on the cankers. Perithecia of *Valsa sordida* were also found on several cankers, but the relation of this ascigerous form to *Cytospora chrysosperma* has not yet been determined. Cuttings of *Populus tremuloides* and of *P. grandidentata* inoculated with spores of *Cytospora chrysosperma* were infected and killed.—*B. B. Higgins.*

1297. Sakurai, M. **Ine no Kinkakubyô ni tsukite.** **[On the sclerotium diseases of rice.]** Ehime Kenritsu Nôji Shikenjô Shuppan Daiichigô (Ehime Agric. Exp. Sta. Publ. 1.) *51 p., 6 pl.* 1917. [In Japanese.]—Four diseases of rice due to sclerotia-forming fungi are described. *Hypochnus sasakii* attacks the plants from June to October, producing irregular brown spots on the leaf-sheaths and more rarely on the blades. Brown sclerotia are formed on the spots or betweenthe leaf-sheaths and the stems. A fungus resembling *Hypochnus centrifugus* forms sclerotia in the tissues of the leaf-sheaths, but the damage is slight. The sclerotia are spherical, white at first, then brown. A third fungus, resembling *Sclerotium oryzae,* attacks the stems and leaf-sheaths during August, causing lodging of plants and consequently heavy damage. The sclerotia are spherical to ovate, black on the surface and dark brown within.

Sclerotium oryzae attacks the leaf-sheaths and stems, causing considerable damage during the ripening season. The sclerotia are spherical to elliptical and more irregular than in the preceding species; the colors are similar.—Lime-Bordeaux mixture and kerosene were ineffective in checking any of these diseases. Lye from wood ashes checked the mycelial development of the first species only. Lime, unless used in large quantities and for long periods, was ineffective. The destruction of the sclerotia by piling the diseased straw with barnyard manure to permit fermentation is recommended as a preventive measure in all cases. Where a temperature of 40°C. is reached 4–7 days are necessary; at 50°C., 30–60 minutes are sufficient; at 60°C., 10 minutes suffice. In addition, application of wood ashes or of lime to fields containing diseased plants is desirable.—*Masao Yoshikawa.*

1298. Selby, A. D., and R. C. Thomas. **Impairment of clover seedings reported.** Monthly Bull. Ohio Agric. Exp. Sta. 6: 90–92. 1921.—This article comprises a preliminary report of a root-rot disease of red clover in Ohio. *Fusarium* sp. has consistently been associated with the disease.—*R. C. Thomas.*

1299. Thurston, H. W., Jr., and C. R. Orton. **A Phytophthora parasite on peony.** Science 54: 170–171. 1921.—Blighted peonies from Pennsylvania proved to be infected with a *Phytophthora* which has not yet been determined. The disease manifests itself as a necrotic condition of buds, surrounding leaves, and stem; infected areas are dark brown or black. Cultural characteristics are given. Zoosporangia are abundant and measure 16.7–22.3 × 20.4 –29.7 μ; oospores have not been observed.—*C. J. Lyon.*

1300. Wakefield, E. M. **Diseases of the oil palm in West Africa.** Agric. Bull. Federated Malay States 8: 244–246. 1920 [1921]. [Reprinted from Kew Bull. 1920: 306–308. 1920.] An account of the diseases of Elaeis guineensis.—*I. H. Burkill.*

1301. Weir, James R. **Notes on Cenangium abietis (Pers.) Rehm on Pinus ponderosa Laws.** Phytopathology 11: 166–170. *Fig. 1–2.* 1921.—*Cenangium abietis* has been found attacking young trees of *Pinus ponderosa* in the Bitterroot Valley, Montana. Apparently infection takes place in all cases through the terminal bud during late fall, and in most cases only the new growth is affected. The needles of infected twigs turn red during the winter, and drop during the following spring and summer, the twigs dying. In some cases where every terminal on a tree was thus killed the tree died before the end of summer.—Results from inoculations indicate that the fungus is parasitic, but is not very aggressive in spreading.—*B. B. Higgins.*

1302. Weir, James R. **Polyporus schweinitzii Fr. on Thuja plicata.** Phytopathology 11: 176. 1921.—A sporophore of *Polyporus schweinitzii* was found arising from the decayed heart wood of a living root of *Thuja plicata.* The rot extended up into the base of the tree and was uniform throughout the affected area, which indicates that this fungus is not the cause of the brown pocket rot often attributed to it.—*B. B. Higgins.*

ERADICATION AND CONTROL MEASURES

1303. Bisby, G. R. **The coöperative potato spraying projects: Progress report for 1918, 1919, and 1920.** Phytopathology 11: 178–193. 1921.—Following the suggestion of the War Emergency Board in 1918, a cooperative potato spraying experiment was undertaken. The author gives the plan of the proposed experiments to be carried out at various experiment stations throughout the U. S. A. and Canada, and also a summary of the work already completed and reported in publications or to him personally.—*B. B. Higgins.*

1304. Blair, R. J. **Decay in pulpwood-deterioration in pulp.** Paper Indust. 2: 95–98. *Fig. 1–3.* 1920.—The causes of decay in pulpwood and in pulp are discussed, and a detailed outline of an investigation of these causes is given.—*H. N. Lee.*

1305. BLAIR, R. J. **Prevention of decay in the timber of pulp and paper mill roofs.** Paper Indust. 1: 837–841, 854. *Fig. 1–6.* 1920.—The author gives a description of the types of roofs commonly used and the defects therein; also the causes of, and methods of preventing, decay.—*H. N. Lee.*

1306. CROSS, WM. E. **The Java-Argentina seedling sugar canes.** Louisiana Planter 66: 184. 1921.—Some of the Java sugar cane seedlings have largely replaced other varieties in Argentina as they are superior in many ways, notably in their greater resistance to mosaic and root rot.—*C. W. Edgerton.*

1307. DETWILER, SAMUEL B. **White pine blister rust control.** Amer. Plant Pest Committee Bull. 6: 1–6. [1921?].—This summarizes the relation of currants and gooseberries to the spread of the rust and the results obtained by eradicating these alternate hosts.—Methods of eradication are given and arguments advanced for the general use of these methods by all owners of white pine in the northeastern U. S. A.—Investigations underlying these control recommendations were more fully treated in Bulletins 2 and 4 (see Bot. Absts. 3, Entries 393, 396, 416, 417; and 7, Entries 1140, 1203, 1224, 1246).—*W. H. Rankin.*

1308. EDGERTON, C. W., AND G. L. TIEBOUT. **The mosaic disease of the Irish potato and the use of certified potato seed.** Louisiana Agric. Exp. Sta. Bull. 181. *15 p., fig. 1–3.* 1921.—In Louisiana the mosaic disease of potatoes considerably reduces the yield of the Bliss Triumph variety, a 50 per cent loss being not uncommon. The mottled appearance of the leaves is common early in the season, but with the approach of warm weather the leaves appear merely curly. The dwarf stage is very common. The Triumph is the only variety extensively grown in Louisiana which is seriously affected by the mosaic, which has occurred there since 1909. Fields from the ordinary commerical Triumph seed which is shipped into Louisiana from the northern U. S. A. generally show a percentage of mosaic plants as high as 50–95.—Certified seed has given variable results. The majority of the lots of certified seed tested have been superior to commercial seed, though some have been very poor, giving a very high percentage of mosaic. Growers, also, have had variable results with certified seed; in 1921 some growers did not recover their seed. It is recommended that growers pay more attention to the certificates of the seed producers, refusing to buy seed showing more than a minimum of mosaic.—*C. W. Edgerton.*

1309. EDWARDS, W. M. O. **Giving medicine to trees.** Florists' Exchange 50: 1078. 1920.—The writer, replying to previous notes on this subject (Florists' Exchange 50: 327) in which is pointed out the futility of injecting chemicals into trees to control diseases, claims that strong perfumes such as musk and apple oil soon check and destroy any blight. A soluble substance introduced into the sap penetrates to every part of the tree, although with diminishing strength. This is made use of in treating trees, enabling them to repel certain diseases for some time. Treatment has been successful in many kinds of trees, including chestnut (for blight —*Endothia parasitica*), apple, pear, peach, larch, hickory, and birch. At one time the writer had a number of young chestnut trees growing in tubs, all of which were more or less affected with blight, but when watered with various solutions (not named) 8 outgrew the disease.—*L. A. Minns.*

1310. FISHER, D. F. **Controlling brown rot of stone fruits.** Better Fruit 15: 3–4, 15. *Fig. 1–2.* 1921.—This disease, manifesting itself as twig and limb cankers and especially "blossom blight," which materially reduces the set of fruit, is a most serious menace to stone fruit crops in northwestern U. S. A. because of its attacks on ripening as well as immature fruits. The life history of the fungus is described, and preventive measures, such as destruction of mummies and open pruning, are suggested. Self-boiled lime-sulphur 8–8–50 is suggested as the safest and best fungicide for controlling this disease.—*S. M. Zeller.*

1311. GOUAUX, C. B., AND OTHERS. **Report of committee on agricultural progress of the Louisiana Sugar Planters' Association for the year 1920.** Louisiana Planter and Sugar Manufacturer 66: 185–189. 1921.—This includes a discussion of the sugar cane mosaic, its spread in

Louisiana, and experimental tests of rogueing as a control measure. Also experiments with fertilizers and tests with various seedling canes are described.—*C. W. Edgerton.*

1312. GUBA, E. F. **Effect of dormant lime sulfur upon the control of apple blotch.** Science 53: 484–485. 1921.—The writer questions the reported controlling of apple blotch (*Phyllosticta solitaria*) by 1 spraying before the buds swell and attributes its failure to the fact that only the spores and sporidial layer within the pseudo-pycnidia are killed, the new infectious area that advances from the initial canker in the spring being unharmed.—*C. J. Lyon.*

1313. HOWITT, J. E. **Experiments with Haskell's method or the so-called dry formaldehyde treatment for the prevention of oat smut.** [Abstract.] Phytopathology 11: 203. 1921.—This method of treating oats has proved very satisfactory. Its chief points of advantage over the older methods are simplicity, and rapidity and ease of application.—*B. B. Higgins.*

1314. KRESS, OTTO, AND C. J. HUMPHREY. **Progress report on the study of wood and wood pulp infection and decay.** Paper Indust. 2: 691–694. 1920.—Specific directions are given for storing pulp wood and pulp so as to prevent decay. The results of paper-making tests on decayed pulps and of comparative pulping tests on infected and sound wood are included.—*H. N. Lee.*

1315. KRESS, OTTO, C. J. HUMPHREY, AND C. AUDREY RICHARDS. **Some observations on the deterioration of wood and wood pulp.** Paper Indust. 1: 526–531. *11 fig.* 1919.—Physical, chemical, and paper-making characteristics of clean and of decayed pulps are described, causes of decay and remedial measures are discussed, and characters by which molds may be distinguished from wood-destroying fungi are given.—*H. N. Lee.*

1316. LOCHHEAD, W. **A quarter century of lime-sulphur.** Canadian Hort. 44: 1–24. 1921.

1317. MANUEL, H. L. **Black spot or anthracnose.** Agric. Gaz. New South Wales 32: 581–582. 1921.—The writer describes anthracnose disease (*Gloeosporium ampelophagum*) of the vine (*Vitis* spp.), which has been severe in certain areas, and discusses methods of control. He recommends swabbing the vines with the following preparation: 50 pounds sulphate of iron dissolved in ½ gallon sulphuric acid in 10 gallons of water.—*L. R. Waldron.*

1318. NISHIKADO, Y., AND C. MIYAKE. **Momitane no shôdoku narabini Ine Gomahagarebyô no Yobôhô. [On seed treatment of rice against sesame-spot leaf blight.] I. Momidane no Ontô Shinsekihô. [Hot-water treatment of seed rice.]** Byôchû-gai Zasshi (Jour. Plant Protection Japan) 5: 693–712 (1–20). 1918.—*Helminthosporium oryzae*, a serious disease of rice seedlings, is spread largely by means of conidia carried on the seed grain. Experiments have shown that the conidia can be destroyed by treatment with hot water at 48–50°C. for 10 minutes. A preliminary soaking in cold water reduces the resistance of the grain to heat, although long continued soaking in water at 15°C. followed by a 10 minute immersion in hot water at 50–52°C. did not result in lowered germination. To control the disease immersion of seed grain for 10 minutes in hot water at 52°C. or for 5 minutes at 54°C. after a preliminary soaking of 24 hours in cold water is recommended.—*Masao Yoshikawa.*

1319. PENNINGTON, L. H., W. H. SNELL, H. H. YORK, and PERLEY SPALDING. **Investigations of Cronartium ribicola in 1920.** Phytopathology 11: 170–172. 1921.—A summary and a brief discussion are given of the results obtained during the year by various investigators. The results show that large areas of *Ribes* are sometimes killed by the fungus. Hence the absence of *Ribes* from an infected area may not mean that it has never been present. The writers confirm previous conclusions that aeciospores may be blown an indefinite number of miles and remain infectious.—*B. B. Higgins.*

1320. PENNINGTON, S., AND H. G. ROBINSON. **Spraying of potatoes for "blight" or "potato disease" (Phytophthora infestans).** Bull. Univ. Coll. Reading 30. *8 p.* 1921.—The experiments described by the authors represent a record of 9 years' systematic trial of ordinary field spray-

ers under field conditions. Bordeaux mixture was used throughout the period, the proportions used being 14 pounds copper sulphate and 9½ pounds lime in 100 gallons of water. The field sprayed was divided into 4 plots, one of which was not sprayed, the second sprayed early, the third late, and the fourth both early and late. The early spraying was made about a fortnight after the potatoes were earthed up, usually about the end of June or beginning of July, and the second or late spraying was made 2–3 weeks later. The authors conclude that for the 9-year period spraying increased the total yield of all the plots; that one late spraying is better than one early spraying, but that double spraying is superior to either alone.—In every case spraying increased the percentage of sound saleable potatoes. The unsprayed plot yielded 4¾ tons saleable tubers, the once-sprayed plots over 5¼ tons, and the twice-sprayed plots 5¾ tons. The percentage by weight of seed stock in the plots showed a small reduction in the case of sprayed plots, but as the total crop was greater in these, the total amount of seed was slightly greater in the sprayed plots. Spraying reduced the number of small potatoes, which in turn reduced the total yield. The authors claim that their results establish the economy of spraying. Diagram 1 represents the effect of spraying on crop yield, and diagram 2 compares the percentage of diseased tubers (average of 4 plots) and the rainfall.—*W. Stuart.*

1321. SANDERS, GEORGE E. **Dusting to date in Nova Scotia.** Canadian Hort. 44: 1–24. 1921.

1322. SEVERIN, HENRY H. P. **Practical use of curly leaf symptoms.** Facts about Sugar 12: 170–173, 212–214. *Fig. 1–25.* 1921.—All of the different symptoms of the curly leaf disease of sugar beets are described, and each symptom is illustrated.—*C. W. Edgerton.*

1323. STEVENSON, JOHN A. **Control of sugar cane mottling disease.** Sugar 23: 92–95. *1 fig.* 1921.—Symptoms of the mosaic disease of sugar cane are described, and theories in regard to its cause discussed. The various organisms found on cane have no connection with the mosaic. The ultimate solution of the mosaic problem is stated to be the use of immune or resistant varieties.—*C. W. Edgerton.*

MISCELLANEOUS (COGNATE RESEARCHES, TECHNIQUE, ETC.)

1324. ANGELIS D'OSSAT, G. DE. **Calcare e viti americane.** [**Lime and American grapes.**] Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) 29²: 58–62. *1 fig.* 1920.—This includes a discussion and review of some previously reported work on the relation between the lime present in the soil and the chlorosis of the grape vine. [See Bot. Absts. 7, Entry 2120.]—*F. M. Blodgett.*

1325. CAESAR, L. **Practical hints for the young plant pathologist.** [Abstract.] Phytopathology 11: 203–204. 1921.

1326. EDGERTON, C. W. **Plant disease investigations at the Agricultural Experiment Station.** Univ. Bull. Louisiana State Univ. 13⁷: *18 p., fig. 1–7.* 1921.—Plant diseases and their importance in Louisiana are discussed, and an outline is given of the work that has been and is being done at the Louisiana Experiment Station.—*C. W. Edgerton.*

1327. HORN, DAVID WILBUR. **Fumigation with formaldehyde—a substitute for the permanganate-formalin method.** Jour. Indust. and Engineering Chem. 11: 126–129. 1919.—The use of bleaching powder and formalin in fumigating rooms is proposed, "using 620 g. bleaching powder and 800 cc. formalin for each 1000 cubic feet to be fumigated; as much formaldehyde gas will be thrown off into the room as by the use of 250 g. of permanganate and 500 cc. formalin, and at only ⅛ the cost."—*G. H. Coons.*

1328. HUMBERT, ERNST E. **A chisel forceps.** Phytopathology 11: 175. *Fig. 1* 1921.—It is claimed this instrument will be valuable in cutting and transferring to media bits of diseased wood.—*B. B. Higgins.*

PHARMACOGNOSY AND PHARMACEUTICAL BOTANY

H. W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 873, 895, 927, 929, 941, 1000, 1037, 1039, 1054, 1082, 1131, 1145, 1235, 1405)

1329. Anonymous. **Comité interministeriel des plantes médicinales et à essences. Les plantes médicinales dans le department du Gard. [Interministerial committee of medicinal plants and substances. The medicinal plants in the department of Gard.]** Nimes, 1920.

1330. Bevan, W. **Sage.** Cyprus Agric. Jour. **16:** 34–36. 1921.—The present article (continued from Cyprus Jour. **15:** 242. 1920) describes the method of cultivating sage applicable to Cyprus. The Cyprus varieties used for medicinal or culinary purposes are *Salvia officinalis*, *S. triloba*, and *S. Cypria* or *Willeana* (Holboe), the former being very common in the hills; both could be successfully cultivated. In Cyprus sage is almost a perennial but as a rule it degenerates after 3-4 years. Propagation by cuttings is claimed to be preferable to seed propagation. The largest demand for sage is for culinary purposes, what is known as the White variety being most suitable. For medicinal purposes Red Sage is mostly used. Instructions for drying sage are given and the period that the dried product can be successfully kept is given as 1 year. The sage oil of commerce is obtained from *Salvia officinalis*, which grows wild in Dalmatia.—*W. Stuart.*

1331. Puxeddu, E., e F. Vodret. **Sull' essenza estratta dalle bacche di Juniperus phoenicea L. di Sardegna. [The essential oils of Juniperus phoenicea from Sardinia.]** Gazz. Chim. Ital. **50**[2]: 245–257. 1920.—A brief review of the literature on the subject is followed by a description of the methods of extraction and a study of the properties of the oil. The density, rotatory power, viscosity, solubilities, index of refraction, saponification number, acidity, ether index, acetyl number, content of aldehydes and phenols, Maumené number, iodine and bromine numbers, as well as color reactions are studied.—*A. Bonazzi.*

PHYSIOLOGY

B. M. Duggar, *Editor*

C. W. Dodge, *Assistant Editor*

(See also in this issue Entries 871, 880, 916, 948, 962, 964, 967, 999, 1015, 1112, 1190, 1192, 1193, 1196, 1235, 1250, 1251, 1252, 1253, 1260, 1288, 1289, 1324, 1367, 1376, 1378, 1379, 1380, 1382, 1446)

GENERAL

1332. Morrow, C. A. [Rev. of: Onslow, M. W. **Practical plant biochemistry.** *viii + 178 p.* University Press: Cambridge, 1920 (see Bot. Absts. 8, Entry 602.)] Science **53:** 416–417. 1921.

DIFFUSION, PHYSICO-CHEMICAL RELATIONS

1333. Brown, J. Howard. **H ions, titration and the buffer index of bacteriological media.** Proc. Soc. Exp. Biol. and Med. **18:** 285–286. 1921.—This paper stresses the importance of determining the buffer effects of media by titration against acid and alkali.—*M. M. Brooks.*

1334. Karrer, Joanne L., and R. W. Webb. **Titration curves of certain liquid culture media.** Ann. Missouri Bot. Gard. **7:** 299–305. 1920.—Titration curves are given for a beet decoction, peptone solution, and Czapek's, Pfeffer's, and Richard's solutions.—*S. M. Zeller.*

MINERAL NUTRIENTS

1335. DUGGAR, B. M. **The use of "insoluble" salts in balanced solutions for seed plants.** Ann. Missouri Bot. Gard. 7: 307–327. 1920.—Results of experiments prepared "to determine the possible value of certain relatively insoluble salts in furnishing the necessary ions for the growth of seed plants" are reported. If such salts should slowly become available in culture solutions "it would only be necessary to add to the culture vessel a surplus of the substances required" in order to imitate in some measure " the chemical relations in the soil." Thus as the plants absorb certain ions the equilibrium of these ions might be maintained by the further solution of the substances furnishing the ions. "As sources of Ca, Mg, Fe, PO_4, SO_4, many insoluble salts have been tested, but no salt of this type is procurable as a practical source of NO_3, so that in most experiments this ion is furnished by KNO_3. A relatively insoluble source of NH_4 ($Mg\,NH_4\,PO_4$) has been found unsatisfactory as a source of nitrogen with the test plants used. In each of three series of cultures in which wheat or wheat and corn were used, one or more of the combinations containing two or more insoluble salts exceeded the growth in the best control solution," which contained $CaSO_4$, $MgSO_4$, soluble ferric phospate, and KNO_3. "In all series, with the test plants mentioned, a group of cultures approached very closely the yields of the best combinations, and in all cases in such best combinations the calcium salt is relatively more soluble than the magnesium salt, except in certain combinations into which ferric citrate enters. Soluble ferric phosphate has proved a valuable constituent in the culture medium in a variety of combinations. In certain cases ferric citrate has proved equally valuable."—*S. M. Zeller.*

1336. GILE, P. L., AND J. O. CARRERO. **Assimilation of nitrogen, phosphorus and potassium by corn when nutrient salts are confined to different roots.** Jour. Agric. Res. **21**: 545–573. 1921.—The paper reports the results of an investigation concerning the assimilation of nitrogen, potassium, and phosphorus when either all the roots were contained in 1 culture vessel with all nutrients, or when the roots were divided between 2 solutions each of which lacked 1 or 2 elements, or 1 solution was complete and the other lacked 1 or 2 elements, or when the roots were divided among 3 flasks each of which lacked 1 or 2 elements. Corn, *Zea Mays*, was used in all the experiments. In all nutrient solutions except those lacking potassium the ratios of bases were as follows: 1 Mg: 4 Ca : 5.3 Na : 14 K. In the solution lacking potassium the ratios were 1 Mg: 4 Ca: 6 Na. Calcium carbonate was used in all cultures. For each treatment 16 plants were used.—The paper contains many detailed figures with respect to root growth, growth of tops, percentage of total roots in the different culture vessels, analytical data on the percentage of nitrogen and K_2O in roots and N, K_2O, and P_2O_5 in tops, as well as figures on the mean assimilation of N, P_2O_5, and K_2O relative to that of the control plants, all roots of which were grown in flasks containing the complete solution.—Some of the general facts brought out are as follows: Depression of growth and assimilation of nutrients are related to the extent to which nutrients are restricted to separate root portions; ratio of root to top growth increases with depression of total growth and assimilation of nutrients; growth of roots in the complete nutrient solutions is "bushy" in habit and greater in extent; in solutions containing nitrogen root growth was greatest. Withholding nitrogen from a part of the root system does not manifest itself so strikingly in the nitrogen content of those roots as withholding either phosphorus or potassium affects the content of these elements.—It is suggested that the diminished assimilation of nutrients under the conditions outlined is not due to inability of roots to absorb the ions with sufficient rapidity, but is due rather to the slowness with which the ions are translocated to the cells where they are utilized. When, for example, the roots are divided into 3 portions, each portion supplied with only 1 of the 3 elements, then, according to the author, it is probable that each element is translocated in different bundles separated from each other. The tissue adjacent to any group of bundles may have a surplus of the 1 element, but the utilization of this 1 is dependent on the other 2, which reach this tissue only with difficulty.—The increased ratio of roots to tops with decreased assimilation may be due to the fact that the root growth is less influenced; or the greater relative root growth may be due to increased movement of organic compounds to the roots, due to a reduced supply of nutrients in the stalk and leaves.—*Lewis Knudson.*

1337. Trelease, Sam F. **The relation of salt proportions and concentrations to the growth of young wheat plants in nutrient solutions containing a chloride.** Philippine Jour. Sci. 17: 527–603. *Fig. 1–12.* 1920.—This study was undertaken to throw more light upon the influence of considerable amounts of potassium chloride in a nutrient solution that also contains other salts supplying all the essential elements. No injurious or retarding effect was observed that could be definitely ascribed to high partial concentrations of potassium chloride, and no characteristic injury was seen that could with certainty be related to the chloride.—*Albert R. Sweetser.*

PHOTOSYNTHESIS

1338. Anonymous. **Carbon-dioxide as a fertilizer.** Sci. Amer. Monthly 3: 141. 1921.

METABOLISM (GENERAL)

1339. Bertolo, P. **Azione dell' acido solforico sull' artemisina.[The action of sulphuric acid upon artemisin.]** Gazz. Chim. Ital. 50: 114–119. 1920.

1340. Bertolo,P. **Nuove ricerche sull' artemisina. [A new study of artemisin.]** Gazz. Chim. Ital. 50: 109–113. 1920.—In the previous communications the author established the identity of the compound, and in the present paper the action of sulphuric acid, hydriodic acid, sodium, chlorine, acetyl-chloride, barium hydrate, and of light are determined.—*A. Bonazzi.*

1341. Ciamician, G., e C. Ravenna. **Considerazioni intorno alla funzione degli alcaloidi nelle piante. [The functions of alkaloids in plants.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) 29^1: 416–420. 1920.—Having found, as reported in a previous article (same publication 29^1: 10. 1920), that betaine —differing from the quaternary bases, such as the salts of tetramethyl ammonia—is only slightly toxic to the bean plant, the authors endeavored unsuccessfully to relate the lack of toxicity to the occurrence of this substance in the bean plant. They also tried to isolate from the extract of the bean plant the volatile bases described by Pictet, which should be of a pyrroline or pyrrolidine nature, the so-called protoalkaloids; but instead found trimethyl amine, wbicb was in accord with their previous results with other plants. They review previous papers to show that the natural alkaloids have in general a markedly toxic action on plants, which indicates that they may have the function of vegetable hormones and prefer this explanation to that of Bernardini, that they are refuse products of catabolism transformed into alkaloids to protect the plants from external enemies. —*F. M. Blodgett.*

1342. Ciamician, G., e C. Ravenna. **Sul contegno di alcune sostanze organiche nei vegetali. XIII. [Upon the behavior of some organic substances in plants. 13th note.]** Gazz. Chim. Ital. 51^1: 200–222. *Fig. 1–3.* 1921.—This is one of a series of papers dealing with the behavior of living plants towards organic substances when such substances are absorbed by the roots or when they are directly inoculated into the tissues (see Bot. Absts. 5, Entry 2240; 6, Entry 1317; 7, Entries 2133, 2134; 10, Entries 1341, 1362). The present contribution is divided as follows: (1) Behavior of *Phaseolus* towards ethyl-, propl-, butyl-, and amylamine, glycocoll, alanine, leucine, and isoamylamine when neutralized by H_3PO_4. (2) Role of the degree of hydrogenation of the compounds studied. In this chapter are studied phthalic and tetrahydrophthalic acids, quinoline and tetrahydroquinoline, and cymene and limonene. (3) Behavior of condensed benzene nuclei, a comparison of aniline and naphthylamine. (4) Role of the length of the carbon chain, studied by a comparison of formic, acetic, propionic, butyric, and valeric acids as well as of isovaleric, caprylic, lauric, and palmitic acids. (5) Number of methyl radicles, a comparison of carbopyrrolic against dimethylpyrrolic-dicarbonic acids, and glucose against methylglucoside, K_2SO_4, and $K\text{-}CH_3\cdot SO_4$. The substances studied were applied to *Phaseolus* growing in a substrate of cotton. The type of development after treatment was taken as an index of the physiological value of the substance. (6 and 8) The fact

that betain is not toxic to *Phaseolus* may indicate that this compound is normally present in this plant, but tests made on large quantities of extracts of plants at the time of inception of flowering failed to demonstrate this substance. It was also shown that the tartaric acid extract of these plants did not contain the pyrrolic bases of Pictet. Esterin, which is normally present in *Phytostigma*, is extremely toxic to *Phaseolus* and *Lycopersicum*. (7) The capacity for oxidation of some compounds was studied by incubating them with the pulp of *Spinacia* in an atmosphere of oxygen. The following are the results: Pyrocatechin, morphine, theobromine, cocaine, atropine, butyric and isobutyric acids are oxidized, while guaiacol, codeine, caffeine, methyl-, ethyl-, and propylamines are not oxidized. When injected into growing *Zea* plants morphine, caffeine, theobromine, butyric and isobutyric acids are oxidized, whereas codeine is not. (9) Tannin is only slightly if at all absorbed by growing *Phaseolus*, *Solanum*, *Zea*, and *Nicotiana* but it appears to induce a general dwarfing, that is the production of a normal dwarf plant. Inoculations led to the same results. As a summary of the conclusions the following may he stated: The amines studied are distinctly toxic while the amino acids are not. Toxicity increases with the degree of hydrogenation. Compounds with condensed benzene nuclei are more toxic than those with single benzene rings. Toxicity is not connected with the length of the carbon chain in the acids. Organic bases are distinctly toxic. The methyl radicle in the compounds studied is not toxic. Plants appear to require the stimulation of alkaloids and so utilize the compounds of decomposition, such as xanthine, through the introduction into such molecules of alcohol or acid radicles. Only such plants as normally contain a given poison are immune to its effects.—*A. Bonazzi.*

1343. DUGGAR, B. M. **The nutritive value of the food reserve in cotyledons.** Ann. Missouri Bot. Gard. 7: 291–298. 1920.—Experiments with Canada field peas show "that for a growth interval of 24 days the removal of the cotyledons after the second day induces a marked depression in the growth rate and this depression is increasingly less, until, when the removal of the cotyledons occurs after 7 days, the amount of growth is very nearly the same as in the control, with cotyledons intact." The cotyledons are practically exhausted in somewhat less than 10 days. In the case of corn effects are neither so striking nor permanent as in peas. The substitution for cotyledons of peas of such organic nitrogenous nutrients as glycocoll, alanin, sodium asparaginate, and sodium nucleinate yielded no proper compensation for the loss of cotyledons, but it is hoped that further experiments along this line where plants are grown under sterile conditions may reveal the nature of the special growth-inducing agent furnished by cotyledons.—*S. M. Zeller.*

1344. GERRETSEN, F. C. **Über die Ursache des Leuchtens der Leuchtbakterien. [The causes of the light in the luminous bacteria.]** Centralbl. Bakt. II Abt. 52: 353–373. *Pl. 2.* 1920.—This investigation was undertaken from the point of view that production of light in luminescent bacteria is due to an enzyme. The relation of the constituents of the culture media to the production of light was carefully studied. In view of the occurrence of so many luminescent organisms in the sea, the role of sodium chloride was carefully investigated. It was found that Cl could be replaced by other anions without materially influencing the light production. The cation, however, could be replaced only by Mg without greatly inhibiting light production. When both anion and cation are replaced the production of light is considerably less than it is in solutions containing sodium salts, or magnesium chloride. The peptones may serve both the nitrogen and carbon requirements of the bacteria, and for the production of light cannot be replaced by any other source of nitrogen. Sterile fish bouillon treated with warm lye and subsequently oxidized with bromine water produced a greenish light similar to that emitted by bacteria. The hexoses have a favorable influence on light production. This may be partly due to the formation of acids which neutralize the toxic alkaline cleavage products of the peptones. Ultraviolet light was found to be an excellent means for killing the organisms without destroying the light function. A light-producing substance, photogen, is produced intracellularly by the enzyme photogenase. The production of light is purely a chemical process and is brought about by the oxidation of the photogen by the oxidase luciferase.—*Anthony Berg.*

1345. Verkade, P. E. **Über die Angreifbarkeit organischer Verbindungen durch Mikroorganismen. II. Mitteilung. [The susceptibility of organic compounds to the attack of microorganisms. II.]** Centralbl. Bakt. II Abt. 52: 273–280. 1920.—This is an attack upon Overton's theory of the permeability of the plasmamembrane; more particularly in reference to the following: That the behavior of the substances of the plasmamembrane as a solvent is parallel to that of olive oil; that the solubility of a substances in olive oil is an index of its ability to penetrate the plasmamembrane, and so of its narcotic effect on the cell. Verkade tested the solubility of benzoic, salicylic, and cinnamic acids at 25°C. in a number of carefully refined fatty oils, and he concludes that the solubility of any organic acid in an oil is not a fixed quantity, but varies with the composition of the oil. Even with oils of similar composition, such as olive, cotton seed, and cocoanut oils, the dissolving power for the acids was quite different. The solubility of a substance in olive oil is an isolated fact, and offers no indication of its solubility in any other fatty substance. This paper does not stress, though it does refer to, the described parallelism between the partition coefficients of different compounds and their relation to the assimilation of certain microorganisms.—*Anthony Berg.*

METABOLISM (ENZYMES, FERMENTATION)

1346. Northrop, John H. **The mechanism of an enzyme reaction as exemplified by pepsin digestion.** Science 53: 391–393. 1921.—Experimental data for this paper are to be found in recent numbers of the Journal of General Physiology (see Bot. Absts. 8, Entries 648, 649; 9, Entry 1635; 10, Entry 282). The peculiarities of general enzyme reactions are listed. In the case of pepsin digestion it has been found that these peculiarities may be quantitatively accounted for on the basis of "a chemical reaction in which the pepsin as well as the protein takes part." This explanation also accounts for the specificity of the pepsin action.—*C. J. Lyon.*

ORGANISM AS A WHOLE

1347. Kopeloff, Nicholas, and Sterne Morse. **Studies in atmospheric requirements of bacteria. I. Water vapor tension.** Proc. Soc. Exp. Biol. and Med. 18: 308–310. 1921.—It was found that inhibition of growth of surface colonies of *B. coli*, *B. subtilis*, *Staphylococcus aureus*, and *Streptococcus hemolyticus* occurred when the water vapor tension was lowered.—*M. M. Brooks.*

1348. Kufferath, H. **Recherches physiologiques sur les algues vertes cultivées en culture pure. I. [Physiological investigations on green algae grown in pure culture. I.]** Bull. Soc. Roy. Bot. Belgique 54: 49–77. 1921.—The author first refers to the work already done concerning the action of gelatin in high concentrations upon microorganisms, and then reports his own results on the action of concentrated gelatinous media upon pure cultures of algae. It is concluded that the species experimented upon react in a rather constant manner in respect to concentration. Certain algae grow at practically any concentration (*Chlorella luteo-viridis* Chodat var. *lutescens* Chodat, *C. vulgaris* Beyerinck, *Oocystis* sp., *O. Naegelii* A. Br., *Stichococcus membranaefaciens* Chodat, *S. bacillaris* Naegeli, and various others). The development is better and more abundant in the lower concentrations. At the higher concentrations, 25–30 per cent gelatin, the following species scarcely grow at all: *Hormidium flaccidum* (Kütz.) Braun f. *nitens*, *H. dissectum* (Gay) Chodat, *H. lubricum* Chodat, *Stichococcus lacustris* Chodat, *Chlamydomonas intermedia* Chodat, *Chlorococcum viscosum* Chodat. Except for *Stichococcus*, there is within certain limits quite constantly an increase in cellular dimensions in proportion to the increase in concentrations. There is in general an advantage in using weak concentrations of gelatin for isolations and for the cultures.—*Henri Micheels.*

1349. Lindet, M. L. **De l'influence que la fonction végétale de la levure exerce sur le rendement en alcool, et d' une nouvelle interprétation du "pouvoir ferment." [The influence of the vegetative function of the yeast on the production of alcohol and a new interpretation of a ferment capacity.]** Bull. Assoc. Chimistes Sucrerie et Distillerie France et Colonies 37: 29–40. 1919.

1350. SCHWEIZER, K. **Études chimico-physiologiques sur la cellule de levure. [Chemical and physiological studies on the yeast cell.]** Bull. Assoc. Chimistes Sucrerie et Distillerie France et Colonies 38: 163–171. 1920.

TEMPERATURE RELATIONS

1351. MACDOUGAL, D. T. **A new high temperature record for growth.** Science 53: 370–372. 1921.—The author reports a new high temperature record for growth in *Opuntia*, and for the higher plants, of 55°C. (131°F.). The experiment is described.—*C. J. Lyon.*

1352. MACDOUGAL, D. T., AND EARL B. WORKING. **Another high temperature record for growth and endurance.** Science 54: 152–153. 1921.—Joints of *Opuntia* grew with a tissue temperature of 56.5°C. in air having a temperature of 58°C.—*C. J. Lyon.*

1353. MUNERATI, O. **L'influenza delle basse temperature sulla germinazione del frumento appena raccolto e dei semi cosi detti freschi. [The influence of low temperatures on the germination of newly harvested grain.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) 29^2: 273–275. 1920.—Newly thrashed grain was germinated at different temperatures, and the results confirm the work of Harrington, to the effect that germination is better at low temperatures.—*F. M. Blodgett.*

1354. VASS, A. F. **The influence of low temperature on soil bacteria.** Cornell Univ. Agric. Exp. Sta. Mem. 27: 1039–1074. 1919.—Sand and soil cultures of *Bacillus radicicola* when subjected to freezing at −15°C. and at −190°C. (the temperature of liquid air) give greater bacterial counts than the unfrozen, the increase being from 50 to nearly 200 per cent. This indicates a breaking up of the bacterial masses in frozen soils rather than an increase by growth and multiplication. The fact that the increased count in slowly thawed material was much less than in the quickly thawed cultures futher substantiates this view. The concentration of the medium, the time of exposure, and the degree of cold are the important factors in resistance to low temperature.—*R. S. Nanz.*

RADIANT ENERGY RELATIONS

1355. BULLER, A. H. R. **Upon the ocellus function of the subsporangial swelling of Pilobolus.** Trans. British Mycol. Soc. 7: 61–64. 1921.—The subsporangial swelling of *Pilobolus* functions as an ocellus which receives the heliotropic stimulus which causes the stipe to turn the "fungus gun" toward the light. The swelling is transparent and refracts light like the bulb of an inverted Florence flask filled with water. When the incident rays of light strike the swelling in such a way that they are parallel with its long axis they are refracted through its walls and converge to form a spot of light at its base. Under these conditions there is physiological equilibrium and no heliotropic response. When, however, the light rays strike the swelling obliquely the spot of light is formed on one side of the wall and in such a case the stipe reacts by growing most rapidly on the side nearest the spot of light. This reaction continues until the spot of light has moved down to the position of equilibrium at the base of the swelling. A method of making a model for demonstrating this reaction of *Pilobolus* is described.—*W. B. McDougall.*

1356. COLIN, M. H. **Action de la lumière sur la richesse saccharine de la betterave. [Action of light on the sugar content of the beet.]** Bull. Assoc. Chimistes Sucrerie et Distillerie France et Colonies 38: 61–74. 1920.—Beets grown in direct sunlight produced a greater tonnage than those in diffuse light but the sucrose content was lower.—*C. W. Edgerton.*

1357. GARDNER, H. A. **Effect of colored light upon plant growth.** Sci. Amer. Monthly 2: 313. *Fig. 1–2.* 1920.—Preliminary experiments indicated a possible advantage in using certain colored, rather than white, lights in the sash of greenhouses.—*Chas. H. Otis.*

1358. Tjebbes, K., en J. C. Th. Uphof. **Der Einfluss des elektrischen Lichtes auf das Pflanzenwachstum. [The influence of electric light on plant growth.]** Landw. Jahrb. **56**: 315–328. *Fig. 10.* 1921.—The experiments were made during the winter of 1919–20 in a greenhouse divided into 2 parts: In the 1st part the plants were under the influence of normal daylight; in the 2nd, under the influence of CO_2 and daylight, also CO_2 and daylight supplemented by electric light. The temperature in all cases was the same, the amount of CO_2 admitted from the cylinders was measured with a gas meter, and the electric light was furnished by bulbs of 200 candle power, burning from 10 p.m. to 6 a.m. Seeds of wheat, rye, flax, beans, peas, cabbage, beets, onions, *Linaria bipartita*, *L. reticulata*, *Theris coronaria*, and *Reseda odorata* germinated several days earlier when daylight was supplemented with electric light; the plants were darker green; contained more chloroplasts; and generally the intercellular spaces of the leaves were larger. As examples of the influence of the supplementary electric light the following are for bulbous plants: Tulips, requiring 29 days to develop in daylight, needed only 23 days under the conditions indicated; hyacinth 19 against 14 days; and crocus 22 against 13 days. Likewise twigs of *Ribes rubra* and *Cornus mas* flower sooner under electric light. Among red algae, *Ceramium rubrum* does not develop phycoerythrin under electric light; and among brown algae, *Ascophyllum nodosum* and *Ectocarpus* do not form phaeophyll. —*J. C. Th. Uphof.*

TOXIC AGENTS

1359. Bettinger, et Delaval. **Action des différents acides sur le Mucor végétal. [The effect of various acids on the vegetative condition of Mucor.]** Bull. Assoc. Chimistes Sucrerie et Distillerie France et Colonies **37**: 254–261. 1920.

1360. Chambers, W. H. **Studies in the physiology of the fungi XI. Bacterial inhibition by metabolic products.** Ann. Missouri Bot. Gard. **7**: 249–289. 1920.—Chambers found that the "growth and death of *Bacillus coli* in bouillon does not follow a constant curve" but depends on the P_H value of that medium. The fermentable carbohydrates of the medium are the particular components which control the active acidity. "Of the products of metabolism acid is the most inhibitory, checking growth slightly at P_H 5.5 and increasing in intensity to a lethal concentration between P_H 5.1 and 4.9. The first inhibition on the alkaline side is noted between P_H 7.0 and 7.6, depending on the age of the culture and other factors. P_H 7.6 is comparable in inhibitory action to P_H 5.1. In an asparagin-$CaCO_3$ bouillon, P_H 9.5 is not fatal." Other inhibitory metabolic products of dextrose are evident near the critical active acidity. "No metabolic product of the nature of an 'auto-toxin' could be found."—*S. M. Zeller.*

1361. Ciamician, G., e C. Ravenna. **Sull'influenza di alcune sostanze organiche sullo sviluppo delle piante. Nota V. [On the influence of some organic substances on the development of plants. Note V.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e. Nat.) **30**[1]: 3–7. 1921.—Continuing their work on the toxicity of various organic compounds on plants (see Bot. Absts. 5, Entry 2240; 6, Entry 1317; 7, Entries 2133, 2134; 10, Entries, 1341, 1342), the authors found that butyl amine induces an albinism though less pronounced than with isoamylamine and nicotine. In previous work it appeared that hydrogenation had an effect on the toxicity of compounds. To test this chinolin was compared with tetrahydrochinolin, phthalic acid with tetrahydrophthalic acid, and cymene with limonene. In each case the 2nd compound mentioned was more harmful than the 1st. In an attempt to study the effect of the length of the chain on the effect of the compound the fatty acids were taken up but no appreciable differences found. Some further tests were also made to determine the effect of additional methyl groups in substances in causing injuries to plants.—*F. M. Blodgett.*

1362. McCall, A. G., and J. R. Hoag. **The relation of the hydrogen-ion concentration of nutrient solutions to growth and chlorosis of wheat plants.** Soil Sci. **12**: 69–77. *2 fig.* 1921. —Wheat plants were grown for 2 months in 4 different nutrient solutions each of which was

modified in such a way as to have 3 distinctly different P_H values, without materially altering the concentration of the essential ions. The hydrogen-ion concentration appreciably influenced the growth rate. The plants grown in solutions with a P_H of 4.2–7.0 suffered from chlorosis.—*W. J. Robbins.*

1363. Muttkowski, Richard A. **Copper in animals and plants.** Science 53: 453–454. 1921.—From incineration experiments the author reports that copper is found in traces in plants, and is "probably inactive."—*C. J. Lyon.*

1364. Osterhout, W. J. V. **The mechanism of injury and recovery of the cell.** Science 53: 352–356. 1921.—By means of his electrical resistance method, the writer has developed a criterion for judging life and death in cells. From experiments with *Laminaria*, the facts "lead to the assumption that the resistance of the cells is proportional to a substance, M, formed and decomposed by a series of consecutive reactions." The series O→S→A→M→B is considered as representing a series of reactions upon which life depends. The mathematical analysis of experimental curves leads to the conclusion that temporary injury is due to the loss of a substance, M. Permanent injury is due to the loss of a substance, O. Recovery may be complete or partial. Equations have been found that make it possible to predict true curves of injuries in both pure salt solutions and mixtures and recovery curves in sea water. Thus the theory is supported by quantitative proofs.—*C. J. Lyon.*

1365. Schweizer, Karl. **L'action du cuivre sur la fermentation alcoolique. [The effect of copper upon alcoholic fermentation.]** Bull. Assoc. Chimistes Sucrerie et Distillerie France et Colonies 37: 160–173. *3 fig.* 1919.

MISCELLANEOUS

1366. Jacobsen, J. P., et M. Knudsen. **Manuel pratique de l'analyse de l'eau de mer. II. Dosage de l'oxygène dans l'eau de mer par la méthode de Winkler. [Practical manual for the analysis of sea water. II. The amount of oxygen in sea water by the Winkler method.]** Bull. Inst. Oceanograph. Monaco 390. *15 p.* 1921.

SOIL SCIENCE

J. J. Skinner, *Editor*

F. M. Schertz, *Assistant Editor*

(See also in this issue Entries 898, 914, 916, 953, 963, 964, 1251, 1260, 1354)

1367. Bauer, F. C. **The relation of organic matter and the feeding power of plants to the utilization of rock phosphate.** Soil Sci. 12: 21–41. 1921.—Experiments with mixtures of rock phosphate and organic matter, with provision for removal of soluble phosphate as formed, failed to show a solvent effect of the decaying organic matter on rock phosphate. In some cases mixtures of rock phosphate and decaying organic matter applied to pot cultures increased the growth of corn more than either alone. The growth of 15 kinds of plants on rock phospbate in sand cultures showed a wide variation in dry matter produced. There was no definite relation between amount of plant growtb and extent of root system, phosphorous content or acidity of the plant juices. Sweet clover possesses remarkable feeding power toward rock phosphate and feldspar and for this reason is well suited to rotation.—*W. J. Robbins.*

1368. Burkill, I. H. **Forests and their retention of rain water.** Gardens' Bull. Straits Settlements 2: 419–421. 1921.—A forest soil is porous. Peat soils in the Malay Peninsula shrink; soils from hill-forests may be washed away on exposure. The greater part of the article is a résumé of Arnold Engler's work on the subject in Switzerland (see Bot. Absts. 9, Entry 710). [See also Bot. Absts. 9, Entry 1232.]—*I. H. Burkill.*

1369. ELVEDEN. **A contribution to the investigation into the results of partial sterilization of the soil by heat.** Jour. Agric. Sci. 11: 197–210. *9 fig.* 1921.—The effect of steaming soil at 100°C. for 1 hour was studied. Samples of soil in 2-inch layers down to 18 inches were used and crops grown over a period of 1–2 years, new series being set up every 3 weeks; data were obtained at all seasons of the year. The soils varied considerably, some being field soils which were much lower in organic material than others taken from gardens. Mustard was used in all the experiments; crops were grown in boxes. Curves and tables are given showing a considerable increase in yield for the steamed soils over those unsteamed, amounting in 1 series of garden soils to 603 per cent and in 1 of field soils to 403 per cent; the average increase for the 44 experiments was 235 per cent. Steaming proved more efficacious in the richer garden soils than in the poorer field soils. There was no indication that enemies of plants congregate at a certain depth according to the season of the year. Soils below the point previously disturbed by cultivation did not respond to the steaming. The benefit obtained from steaming extends over more than 1 cropping period. Various other methods of sterilizing soil—flaming and electrical heating—were not so efficient. To test out Russell's theory of the action of soil protozoa, unsteamed soils were mixed with steamed soils in varying proportions, the protozoan fauna being thereby supposedly quickly re-introduced. The results all point to some other effect since the amount of yield varied rather directly with the amount of treated soil present. The author concludes that the principal effect of steaming soils is a direct one on the composition of the soils rather than the destruction of protozoa.—*V. H. Young.*

1370. FISHER, R. A. **Studies in crop variation I. An examination of the yield of dressed grain from Broadbalk.** Jour. Agric. Sci. 11: 107–135. *3 fig.* 1921.—A survey is made of the results of a statistical examination of the yield of plots of the Broadbalk wheat field at the Rothamsted Station for a period of 67 years. The results are treated from a mathematical point of view and an analysis made of the factors causing various types of variation over long periods of time. The author finds that "average wheat yields, even over long periods from different fields or for different seasons cannot approach in accuracy the comparison of plots of the same field in the same seasons."—*V. H. Young.*

1371. FRED, E. B. **The fixation of atmospheric nitrogen by inoculated soybeans.** Soil Sci. 11: 469–477. *Pl. 1–3.* 1921.—On Plainfield sand, inoculation increased the yield of Ito San soybeans more than 3 times and resulted in a net gain of 57 pounds of nitrogen per acre. Approximately 87 per cent of the total increase of nitrogen was in the soybean tops. Although the latter were removed the favorable effect of inoculation was noted in the growth of rye the following year.—*W. J. Robbins.*

1372. FRED, E. B., W. H. WRIGHT, AND W. C. FRAZIER. **Field tests on the inoculation of canning peas.** Soil Sci. 11: 479–491. *Pl. 1–3.* 1921.—Inoculation increased the yield and per cent of nitrogen in canning peas on a rich, silt loam soil, unlimed and acid, and on a neutral soil which had been heavily manured for several years. It had no effect on a slightly acid, heavy, rich, clay loam soil.—*W. J. Robbins.*

1373. LEACH, B. R. **Experiments with hot water in the treatment of balled earth about the roots of plants for the control of Japanese beetle larvae.** Soil Sci. 12: 63–68. *1 fig.* 1921.—Hot water, because of its slowness and injury to the trees, cannot be used to control the grubs of the Japanese beetle.—*W. J. Robbins.*

1374. LEACH, B. R., AND J. W. THOMAS. **Experiments in the treatment of balled earth about the roots of coniferous plants for the control of Japanese beetle larvae.** Soil Sci. 12: 43–61. *Pl. 1–2.* 1921.—The results of the toxicity of sodium sulphocarbonate, sodium ethyl xanthate, sodium cyanide, copper sulphate, potassium fluoride, camphor, carbon disulfide, thymol, mustard gas, and chloroform on naked *Popillia* grubs, on the grubs imbedded in soil, and on the roots of coniferous trees are reported.—*W. J. Robbins.*

1375. LIPMAN, J. G., AND A. W. BLAIR. **Nitrogen losses under intensive cropping.** Soil Sci. 12: 1–19. *Pl. 1–2, 1 fig.* 1921.—A study has been made of nitrogen losses from a loam soil and cylinders with natural drainage which for 20 years have been under a 5-year rotation of corn, oats (2 years), wheat, and timothy. Different forms of nitrogen were used alone and with farm manure. A complete record of the amount of nitrogen applied in the fertilizers and that removed by the crops has been kept. Also, nitrogen determinations were made on the original soil in 1907, 1912, and 1918. During the first 10 years the loss of nitrogen amounted to 103 pounds per acre annually; during the 3rd 5-year period it was the same; and during the 4th 5-year period there was a gain in some cylinders, due largely to the growth of legume crops. Carbon determinations made in 1918 show gains in carbon content for nearly all those cylinders that received both farm manure and commercial fertilizers.—*W. J. Robbins.*

1376. MCTAGGART, ALEXANDER. **The influence of certain fertilizer salts on the growth and nitrogen-content of some legumes.** Soil Sci. 11: 435–455. *Pl. 1.* 1921.—Alfalfa, Canada field peas, or soybeans were grown in the greenhouse in wooden boxes holding 128 pounds of soil, mostly sand low in plant nutrients. Nitrogen as dried blood, sodium acid phosphate, potassium chloride, calcium sulphate, or mixtures of the above, both limed and unlimed, were applied to the soil. At the end of growth the plants were dried and the total nitrogen determined. The nitrate content of the soil was also determined 3 weeks after harvest. Phosphorus, alone, increased the dry matter and total nitrogen decidedly and to a less extent the per cent of nitrogen. Nitrogen as a single element did not benefit the plants with respect to yield, nitrogen, or per cent of nitrogen. Combined nitrogen in the amount used did not hamper nitrogen assimilation. Potassium, used alone, increased the total nitrogen and dry matter of Canada field peas and alfalfa but not of soybeans; it increased the per cent of nitrogen in all 3 crops. Sulphur, alone, increased the growth and nitrogen of alfalfa but had no effect on the peas or soybeans. Where phosphorus was applied the greatest nitrate accumulation resulted after all crops. Nitrogen, alone, increased the nitrate accumulation after all 3 crops but with other elements it had no effect; potassium slightly inhibited it. Sulphur increased nitrification in soil which had grown alfalfa; this was not true in the case of peas and soybeans. In general there appears to be a correlation between dry matter produced and soil nitrification; this probably is due to the greater root system, which subsequently decays.—*W. J. Robbins.*

1377. MILLER, E. J., AND C. S. ROBINSON. **Studies on the acid amide fraction of the nitrogen of peat.** Soil Sci. 11: 457–467. 1921.—Attempts to separate glutaminic acid directly from the hydrolysate of peat failed. The application of Foreman's method (Biochem. Jour. 8: 463) resulted in the separation of both glutaminic and aspartic acids from this material and indicated the presence of pyrolidon carboxylic acid.—*W. J. Robbins.*

1378. SCHMIDT, E. W. **Torf als Energiequelle für stickstoffassimilierende Bakterien. [Peat as a source of energy for nitrogen-assimilating bacteria.]** Centralbl. Bakt. II Abt. 52: 281–289. 1920.—The author calls attention to the possibilities of utilizing peat deposits for increasing the nitrogen supply of soil. His investigations have shown that the cell-membrane substances of young sphagnum peat are attacked by cellulose bacteria and that the resulting cleavage products may serve as nutrients for azotobacters. It was also shown that these cell-membrane substances in their raw state are comparatively resistant to the attacks of the cellulose bacteria. This resistance may be largely overcome by grinding, steaming, or boiling. When hydrolyzed with dilute hydrochloric acid and subsequently neutralized, the resulting product forms a very desirable medium for the growth of azotobacters. To what extent peat can be used as a fertilizer, further experimentation must determine.—*Anthony Berg.*

1379. SEN-GUPTA, NAGENDRA NATH. **Dephenolization in soil.** Jour. Agric. Sci. 11: 136–158. *6 fig.* 1921.—Previous workers have shown that organisms isolated from the soil are capable of decomposing phenol, *p*-cresol, and other aromatic compounds *in vitro.* The author has studied the disappearance of phenol and the 3 cresols, especially *m*-cresol, from

several types of Rothamsted soils. He has elaborated colorimetric methods for the estimation of phenol and cresols which indicate an instantaneous loss of phenol followed by further loss, slower and different in character. Phenol and the 3 cresols disappear with more or less ease from all soils examined. The slow disappearance seems to be largely due to microorganisms though evidence is adduced to show that some non-biological factor is in part responsible. In soil autoclaved at 130°C. for 20 minutes no disappearance takes place, but the action proceeds slowly in the presence of considerable amounts of toluene or mercuric chloride. Soils partially sterilized by toluene, which is removed by evaporation, are dephenolized more rapidly than ordinary soils, but steaming does not result in such an increase in rate. Dephenolization takes place slowly in air-dried soils. It was found that successive doses of phenol or *m*-cresol disappeared at increasing rates—a result which is regarded as pointing to an action mainly biological in character. Two types of bacteria have been isolated from soil which are able to decompose phenol in culture solutions containing mineral salts and phenol, and a 3rd capable of decomposing *m*-cresol. Three types of dephenolization are recognized: A biological type, an instantaneous chemical or physical type, and a slower chemical or physical type; the mechanism of the latter 2 types has not been elucidated.—*V. H. Young.*

1380. SMITH, R. S. **Some effects of potassium salts on soils.** Cornell Univ. Agric. Exp. Sta. Mem. 35. *567–605.* 1920.—The work was designed to show the effect of common fertilizer salts of potassium upon the growth of wheat plants and upon bacterial activities. Silt loam of the Hagerstown, DeKalb, and Volusia series were used; in some cases lime was applied. Data are presented on the grain and straw from crops grown upon the soil and from plants grown in water extracts of the soils. These indicate that potassium chloride became toxic at 1000 pounds per acre with Hagerstown soil and at 2000 pounds with DeKalb soil. Potassium sulphate increased growth in both of these soils and no toxicity was noted with an application of 3000 pounds per acre.—Under these treatments potassium chloride reduced the accumulation of nitrates, as determined by the phenol disulphonic method, while potassium sulphate exerted a stimulating effect on nitrification; in DeKalb soil the greatest stimulation occurred with 1000 pounds per acre. A study of the interchange of bases showed that both potassium chloride and potassium sulphate replaced calcium markedly. Manganese was replaced in very appreciable amounts in Hagerstown and DeKalb soil. The soil highest in water-soluble manganese showed the least nitrifying efficiency, the smallest growth of wheat in pot cultures, and the poorest growth of wheat rootlets in extract cultures. No iron or aluminum was found in any of the water extracts.—*J. K. Wilson.*

1381. THOMAS, M. D. **Aqueous vapor pressure of soils.** Soil Sci. 11: 409–434. *5 fig.* 1921. —A dynamic method of measuring aqueous vapor-pressure lowerings of soil accurate to 0.01 mm. of mercury at 25°C. is described. The vapor-pressure-moisture curves are hyperbolae over a wide range of moisture contents. Correlations between the vapor pressure of the soil and the following properties are given: Hygroscopic coefficient, wilting coefficient, moisture equivalent, "solid water," capillary potential, surface tension, and curvature of the moisture surface.—*W. J. Robbins.*

1382. TURPIN, H. W. **The carbon-dioxide of the soil air.** Cornell Univ. Agric. Exp. Sta. Mem. 32. *315–361.* 1920.—The CO_2 content of air in Dunkirk clay loam was studied by obtaining samples of the air by aspiration; after absorption of the CO_2 in Ba $(OH)_2$ the excess hydroxide was titrated with standard oxalic acid (the equivalent of the latter in terms of CO_2 having been determined by titrating with standard $KMnO_4$ solution). Two crops of oats and 1 of millet were grown in the soil, the latter contained in large cans; some cans were kept free from vegetation. The CO_2 content of the air from the cropped soil increased as the crops approached their greatest growing period; fluctuations were noted which were thought to be due largely to temperature and pressure variations. High pressures were accompanied by low CO_2 contents while high temperatures resulted in high CO_2 production. Some positive correlation seemed to exist between the amount of water percentage transpired and the per cent of CO_2; this was noted at a period during which the plant growth was most vigorous. From this and other data presented it is concluded that the increase in CO_2 in the cropped soil was due largely to the respiratory activities of the plant roots.—*J. K. Wilson.*

1383. Weis, Fr., og K. A. Bondorff. **Undersögelse af Skovjord under overnaerede graner i Lyngby Skov.** [Investigation of soil underlying over-nourished spruce in Lyngby Forest.] *Forst. Forsögsv. Danmark* 5: 343–352. *Pl. 1.* 1920.—A chemical examination was made of the soil underlying (1) over-nourished spruce (*Picea excelsa*), and (2) spruce of normal development. The soil of the former showed in grams per cubic meter of soil: total N 7184, $NaNO_3$ 19.9, CaO 2136, K_2O 475, and P_2O_5 476. In the soil of the normally developed spruce the amounts were: total N 1206, $NaNO_3$ 1.3, CaO 1340, K_2O 654, P_2O_5 218. The amount of nitrate in the soil of over-nourished spruce is much greater than in the other, and is 10 times as great as that ordinarily found in agricultural soil; it is considered the chief cause of the hypertrophy. This soil was further tested in the laboratory by adding $(NH_4)_2SO_4$ with and without $CaCO_3$, $(NH_4)_2CO_3$, KNO_2 with and without carbonate, peptone, and casein with and without carbonate. All tests except those with sterilized samples and those in which peptone alone was added showed increases in $NaNO_3$. The bacteria responsible for the nitrification have not been found; all attempts at inoculation have failed.—*J. A. Larsen.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 870, 1046)

GENERAL

1384. Anonymous. **Trees and shrubs of Mexico.** [Rev. of: Standley, Paul C. **Trees and shrubs of Mexico. Gleicheniaceae to Betulaceae.** Contrib. U. S. Nation. Herb. 23: 1–169. 1920 (see Bot. Absts. 8, Entry 744).] Nature 107: 603. 1921.

1385. Albertson, Alice O. **Nantucket wild flowers.** *Small 8vo., xlv + 442 p., illus.* G. P. Putnam's Sons: New York and London, 1921.—The author has carefully selected 300 species to represent the typical wild flower flora of Nantucket. The plants are popularly but reliably described under their scientific and common names and many of them are attractively illustrated, some being depicted in color. Interesting and valuable information, not hitherto of common knowledge, is recorded for a number of the species included in the work.—*J. M. Greenman.*

1386. Britton, C. E. **Report of the distributor for 1917.** Bot. Soc. and Exchange Club British Isles Rept. 5: 205–262. 1917 [1918].—Specimens distributed 6222.—*G. C. Druce.*

1387. Cleghorn, H. **General index of the plants described and figured in Dr. Wight's work entitled "Icones Plantarum Indiae Orientalis."** *4 to, 68 p.* Bernard Quaritch, Ltd.: London, 1921.—This publication, as the title indicates, is an alphabetical index to the genera and species figured in Wight's illustrations of East Indian plants. It renders possible ready reference to 2101 illustrations published in that work.—*J. M. Greenman.*

1388. [Druce, G. Claridge.] [Rev. of: Willis, J. C. **A dictionary of the flowering plants and ferns.** *4th ed. vii + 701 p.; suppl. liv p.* Cambridge Univ. Press: 1919.] Bot. Soc. and Exchange Club British Isles Rept. 5: 617–618. 1919 [1920].

1389. Gaumé, J. [Rev. of: Kops, Jan, F. W. van Eeden, en L. Vuyck. **Flora Batava. Afbeelding en Beschrijving der Nederlandsche Gewassen.** *402e-405e Aflevering, pl.* 2001–2016. Martinus Nijhoff:'s-Gravenhage, 1920 (see Bot. Absts. 8, Entry 1541).] Rev. Gén. Bot. 33: 397. 1921.

1390. Greyerz, Hans von. **Die hohe Eibe von Chillon.** [The tall yew of Chillon.] Schweiz. Zeitschr. Forstw. 72: 146–147. *1 pl.* 1921.—The yew is a memorable tree because, in former days, it was planted upon the grave as a symbol of immortality. The specimen de-

scribed stands in the state forest of Chillon at an elevation of 700 m. with a circumference of 1.82 m. at breast height, and a height of 21.5 m. During the last 16 years its average growth per year has been 4.4 mm. in diameter and 6–7 cm. in height. Other yew trees of greater diameter are known but the tallest recorded, aside from the Chillon yew, is 19 m.—*J. V. Hofmann.*

1391. Gundersen, Alfred. **Plant families: a plea for an international sequence.** New Phytol. 19: 264–271. 1920.—Several proposed classifications are quoted and the following summary is given: " 1. A periodic inventory of facts and opinions which appear to have a bearing on the sequence of families, especially of living vascular plants, is to be greatly desired. 2. Where facts are not conclusive the definite goal of a truly international sequence should be sought through agreement. 3. Standard numbers as part of symbols for plant families, revised at suitable intervals, would serve important practical purposes, especially in the co-ordination of information."—*I. F. Lewis.*

1392. Hayata, Bunzo. **The natural classification of plants according to the dynamic system.** Icones Plantarum Formosanarum 10: 97–234. 1921.—The author proposes an arrangement of the families of flowering plants that is subject to change according to the viewpoint of the systematizer. This is in direct opposition to the prevalent view that regards only one natural system of classification possible since only one phylogenetic tree is possible. Species, genera, and families have changeable positions according to the criteria of comparison and it is neither natural nor necessary that a species should in all cases be placed between the same limits. Rather it should be placed between certain limits according to one view and between other limits according to another view. The inter-relationships of plants are to be expressed rather by the complications of a net than by the serial order of the branches of a tree. The resemblance of individuals or species is not confined to cases of blood-relationship but is manifested by the constitutional relationship. All individuals possess innumerable genes or factors. The individuals assume various forms according to the particular genes that are potent or latent and according to the different relations or segregations of potent genes. The relation of one individual to the others in phenomenal appearance is the relation of the mutual participation or sharing of potent or latent genes in individuals. As genes change so change individuals. Actual or blood relationship is only one phase of the dynamic system. If organisms are very similar in their external forms they should be taken into the same group. The author contrasts in great detail his dynamic system with the static one of Engler. That author's sequence is used as a framework and grouped about the families are arranged the other families that, in one way or another, are related to them. Another order rather than Engler's could have been used as a framework with equal value. Engler's sequence is recapitulated and under each family is discussed its relationships with other families.—*E. B. Payson.*

1393. Hitchcock, A. S. **Report of the Committee on Nomenclature of the Botanical Society of America.** Science 53: 312–314. 1921.—The committee of 9 members presents a code of rules. It suggests that, because the code invites international support, the judicial body should be an international commission and that this code be recommendations to it.—*C. J. Lyon.*

1394. R[oper], I. M. [Rev. of: Hayward, Ida, and G. Claridge Druce. **The adventive flora of Tweedside.** *xxxii + 296 p.* T. Buncle & Co.: Arbroath, 1919.] Bot. Soc. and Exchange Club British Isles Rept. 5: 596–597. 1919 [1920].

SPERMATOPHYTES

1395. Bennett, Arthur. **Atriplex calotheca: a correction.** Jour. Botany 59: 77. 1921. —The plant so listed in Jour. Bot. 58: 295. 1920 is not that species and the record is withdrawn.—*K. M. Wiegand.*

1396. BENOIST, RAYMOND. **Contribution à l'étude de la flore de la Guyane française. [Contribution to the study of the flora of French Guiana.]** Bull. Mus. Hist. Nat. [Paris] **26:** 351–357. 1920.—Miscellaneous notes are given concerning various species of the Samydaceae, Turneraceae, Passifloraceae, and Caricaceae of French Guiana. Exsiccatae are cited. *Casearia Martini* and *C. umbellifera* are described as new.—*E. B. Payson.*

1397. BENOIST, RAYMOND. **Descriptions d'espèces nouvelles d'Hypoestes de Madagascar. [Descriptions of new species of Hypoestes from Madagascar.]** Bull. Mus. Hist. Nat. [Paris] **26:** 262–266. 1920.—The following species are described as new: *Hypoestes Decaryana, H. cruenta, H. Viguieri, H. setigera,* and *H. longituba.*—*E. B. Payson.*

1398. BENOIST, RAYMOND. **Plantes récoltées par M. Wachenheim en Guyane française. [Plants collected by M. Wachenheim in French Guiana.]** Bull. Mus. Hist. Nat. [Paris] **26:** 555–560. 1920.—The author gives a list of 67 species collected in the region of Maroni, near the convict camp of Godebert. *Duroia plicata* and *Maripa scandens* Aubl. var. *argentea* are described as new to science.—*E. B. Payson.*

1399. BLAKE, S. F. **Revisions of the genera Acanthospermum, Flourensia, Oyedaea, and Tithonia.** Contrib. U. S. Nation. Herb. **20:** 383–436. *Pl. 23.* 1921.—Under this title 4 papers are included, being revisions of the 4 genera of American *Asteraceae* named in the title. In the first 8 species of *Acanthospermum* are described and the fruit of each illustrated, as well as the floral details of the type species of the genus, A. *australe.* In the 2nd 23 species of *Flourensia* are described. The 3rd paper describes the 13 known species of *Oyedaea,* one of which is of doubtful status. The 4th describes the 10 known species of *Tithonia.* In each paper the history of the group is briefly considered, followed by a technical description of the genus, and keys to and descriptions of the species. The following new names occur: *Acanthospermum* section *Lecocarpopsis, A. Donii, A. simile, A. consobrinum; Flourensia hirta, F. polyclada, F. Niederleinii, F. oolepis, F. leptopoda, F. angustifolia* (DC.) Blake; *Oyedaea scaberrima* (Benth.) Blake, *O. wedelioides* (Klatt) Blake, *O. reticulata, O. Rusbyi, O. lanceolata* (Rusby) Blake, *O. trachyphylla; Aspilia cupulata* (*Oyedaea angustifolia* Gardn.), *A. Bonplandiana* (Gardn.) Blake; *Tithonia calva lancifolia* (Robins. & Greenm.) Blake, *T. diversifolia glabriuscula.*—*S. F. Blake.*

1400. BROWN, N. E. **A new book on Cactaceae.** [Rev. of: BRITTON, N. L., AND J. N. ROSE. **The Cactaceae. Vol. 2.** Carnegie Inst. Washington Publ. 248. *vii + 239 p., 40 pl.* 1920 (see Bot. Absts. 7, Entry 2194).] Nature **107:** 580–581. 1921.—The work is regarded as the first in English giving a complete account of the order and is much in advance of the German works on these plants. Failure to mention exceptions in the keys is pointed out as a fault.—*O. A. Stevens.*

1401. BUSCALIONI, LUIGI, E GIUSEPPE MUSCATELLO. **Studio monografico sulle specie americane del Gen. "Saurauia" Willd. [Monograph of American species of the genus Saurauia Willd.** (Continued).] Malpighia 28: 473–488. 1920.—The species *Saurauia pseudopedunculata* Busc. n. sp., *S. barbigera* Hook., and *S. Waldheimia* Busc. n. sp. are discussed in this number.—*Edith K. Cash.*

1402. CAILLE, O., ET H. POISSON. **Note sur la culture en plein air de quelques Ehretia et sur l'histoire des espèces horticoles de ce genre. [Note on the culture in the open air of some Ehretias and on the history of the horticultural species of this genus.]** Bull. Mus. Hist. Nat. [Paris] **26:** 578–581. 1920.

1403. CAMUS, AIMÉE. **Note sur la synonymie et la repartition geographique de quelques Themeda. [Note on the synonymy and geographical distribution of some Themedas.]** Bull. Mus. Hist. Nat. [Paris] **26:** 423–428. 1920.—The present paper treats those species of *Themeda* not considered in a recent paper by the same author. Specimens are cited, synonyms are given, and the geographical distribution indicated for the various species. A dichotomous

key is given for the subspecies and varieties of *T. gigantea*. The following new combinations, new varieties, and new subspecies are proposed: *Themeda laxa* (*Anthistiria laxa* Anderss.) *T. strigosa* (*Anthistiria strigosa* Ham.), *T. ciliata* Hack. subsp. *genuina*, *T. ciliata*Hack., subsp. *chinensis*, *T. ciliata* Hack. subsp. *Helferi* (*T. Helferi* Hack.), *T. Thwaitesii* (*Anthistiria Thwaitesii* Hook. f.), *T. anathera* Hack. var. *genuina*, *T. anathera* Hack. var. *major*, *T. anathera* Hack. var. *glabra*, *T. Hookeri* (*Anthistiria Hookeri* Griseb.), *T. gigantea* Hack. var. *intermedia* (*T. gigantea* Hack. subsp. *intermedia* var. *intermedia* Hack.), *T. gigantea* Hack. var. *dubia* (*T. gigantea* Hack. subsp. *intermedia* var. *dubia* Hack.).—*E. B. Payson.*

1404. CAMUS, AIMÉE. **Note sur le genre Themeda Forsk. (Graminées). [Note concerning the genus Themeda.]** Bull. Mus. Hist. Nat. [Paris] 26: 266–273. 1920.—A dichotomous key is given to the 11 recognized species of *Themeda*. A similar key is also given to the 13 varieties of *T. triandra*. Synonyms are given for the varieties and specimens are cited. The following new varieties and varietal combinations are proposed: *Themeda arguens* Hack. var. *genuina*, *T. triandra* Forsk. var. *vulgaris* (*T. Forskalii* Hack. var. *vulgaris* Hack.), *T. triandra* Forsk. var. *imberbis* (*T. Forskalii* Hack. var. *imberbis* Hack.), *T. triandra* Forsk. var. *mollissima* (*T. Forskalii* Hack. var. *mollissima* Hack.), *T. triandra* Forsk. var. *argentea* (*T. Forskalii* Hack. var. *argentea* Hack.), *T. triandra* Forsk. var. *Roylei*, *T. triandra* Forsk. var. *punctata* (*T. Forskalii* Hack. var. *punctata* Hack.), *T. triandra* Forsk. var. *glauca* (*T. Forskalii* Hack. var. *glauca* Hack.), *T. triandra* Forsk. var. *Burchellii* (*T. Forskalii* Hack. var. *Burchellii* Hack.), *T. triandra* Forsk. var. *syriaca* (*T. Forskalii* Hack. var. *syriaca* Hack.), *T. triandra* Forsk. var. *brachyantha* (*T. Forskalii* Hack. var. *brachyantha* Hack.), *T. triandra* Forsk. var. *major* (*T. Forskalii* Hack. var. *major* Hack.), *T. triandra* Forsk. var. *cerifera*.—*E. B. Payson.*

1405. CAMUS, AIMÉE. **Notes sur quelques Cymbopogon odorants (Graminées). [Notes on some fragrant Cymbopogons (Gramineae).]** Bull. Mus. Hist. Nat. [Paris] 26: 562–566. 1920. —Notes are given concerning species and varieties treated by Hackel under the name of *Andropogon Schoenanthus* L. The following new species and new combinations are proposed: *Cymbopogon annamensis* (*C. Martini* var. *annamensis* Camus), *C. mekongensis*, *C. bassacensis*, *C. nervatus* (*Andropogon nervatus* Hochst.), *C. densiflorus* (*Andropogon densiflorus* Steudel). The variety *traninhensis* of *C. confertiflorus* Stapf is also described. All the plants considered in this paper are fragrant and contain an essential oil.—*E. B. Payson.*

1406. CAMUS, AIMÉE. **Un Andropogon nouveau de l'Asie orientale. [A new Andropogon from eastern Asia.]** Bull. Mus. Hist. Nat. [Paris] 26: 561. 1920.—*Andropogon Thorelii* is described as new.—*E. B. Payson.*

1407. CAMUS, AIMÉE. **Une espèce nouvelle de bambon. [A new species of bamboo.]** Bull. Mus. Hist. Nat. [Paris] 26: 567. 1920.—*Gigantochloa cochinchinensis* is described as new to science.—*E. B. Payson.*

1408. CARDOT, J. **Notes sur les espèces asiatiques du genre Photinia, section Pourthiaea (Rosacées). [Notes on the Asiatic species of the genus Photinia, section Pourthiaea (Rosaceae).]** Bull. Mus. Hist. Nat. [Paris] 26: 568–571. 1920.—Extensive notes are given concerning several species of *Photinia*. The following new combinations are made: *Photinia Calleryana* (*Pourthiaea Calleryana* Dcne.), *P. cotoneaster* (*Pourthiaea cotoneaster* Dcne.), *P. fokienensis* Franch. mss. (*Photinia glabra* var. *fokienensis* Franch.).—*E. B. Payson.*

1409. CHOUX, P. **Une nouvelle Asclépiadacée aphylle du nord-ouest de Madagascar. [A new leafless Asclepiad from northwestern Madagascar.]** Compt. Rend. Acad. Sci. Paris 172: 1308–1311. 1921.—An extended discription of this new plant is given. It is placed in the tribe *Cynanchineae* and named **Nematostemma** (n. gen.); one species is characterized, namely, *N. Perrieri*.—*C. H. Farr.*

1410. DANGUY, P. **Contribution à l'étude de la flore forestière de Madagascar. [Contribution to the study of the forest flora of Madagascar.]** Bull. Mus. Hist. Nat. [Paris] **26:** 252–253. 1920.—*Tisonia Faucherei* and *Turraea Thouvenotii* are described as new to science. —*E. B. Payson.*

1411. DANGUY, PAUL. **Lauracées de la forêt d'Analamazaotra (Madagascar). [Lauraceae from the forest of Analamazaotra (Madagascar).]** Bull. Mus. Hist. Nat. [Paris] **26:** 547–550. 1920.—Fifteen species of this family are known to occur in this forest. Of these, 6 are here described as new and 2 others redescribed in part. The following new names and new combinations occur: *Ravensara ferruginea, R. crassifolia* (*Cryptocarya crassifolia* Bak.), *R. latifolia. R. ovalifolia, R. cryptocaryoides, R. anisata,* and *R. Thouvenotii.*—*E. B. Payson.*

1412. EVANS, A. H. **On Geranium purpureum Vill. and G. Robertianum L.** Bot. Soc. and Exchange Club British Isles Rept. **5:** 724–729. 1919 [1920].

1413. GAMBLE, J. S. **Flora of the Presidency of Madras.** Part IV. *579–768.* Adlard and Son and West Newman: London, 1921.—This part includes the families Rubiaceae to Ebenaceae ending with a description of the genus *Diospyros.* The following new combinations are recorded: *Oldenlandia nitida* (*Hedyotis nitida* W. & A.), *O. caerulea* (*Hedyotis caerulea* W. & A.), *O. articularis* (*Hedyotis articularis* Br.), *O. sisaparensis* (*Hedyotis sisaparensis* Gage), *O. albo-nervia* (*Hedyotis albo-nervia* Bedd.), *Randia Brandisii* (*R. tomentosa* W. & A., not Bl.), *Tricalysia sphaerocarpa* (*Diplospora sphaerocarpa* Hook. f.), *T. apiocarpa* (*Diplospora apiocarpa* Hook. f.), *Plectronia ficiformis* (*Canthium ficiforme* Hook. f.), *Pavetta zeylanica* (*P. hispidula* var. *zeylanica* Hook. f.), *Stylocoryne lucens* (*Webera lucens* Hook. f.), *S. canarica* (*Webera canarica* Hook. f.), *S. nilagirica* (*Webera nilagirica* Hook. f.), *Anaphalis subdecurrens* (*Gnaphalium subdecurrens* DC.), *A. Lawii* (*A. oblonga* DC. var. *Lawii* Hook. f.), *Campanula Wightii* (*C. ramulosa* Wt., not Wall.), and *Isonandra montana* (*I. Wightiana* A. DC. var. *montana* Thw.).—*J. M. Greenman.*

1414. GUILLAUMIN, A. **Contribution à la flore de la Nouvelle-Caledonie. [Contribution to the flora of New Caledonia.]** Bull. Mus. Hist. Nat. [Paris] **26:** 254–261, 361–368, 434–435. 1920.—XXXI (254–261). Various species collected by M. Franc in New Caledonia are listed and the following new species are described: *Uvaria Baillonii, Pittosporum hematomallum, P. pronyense, P. sylvaticum, Sterculia Francii, Antholoma haplopoda, Sarcomelicope argyrophylla.* XXXII (361–368). Species collected by various collectors are listed. The species of *Agation* and *Pittosporum* are differentiated by means of dichotomous keys. XXXIII (434–435). The list of species collected by various authors is continued.—*E. B. Payson.*

1415. GUILLAUMIN, A. **Les espèces cultivées du genre Listrostachys (Orchidacées-Sarcanthées). [The cultivated species of the genus Listrostachys (Orchidaceae-Sarcantheae).]** Bull. Mus. Hist. Nat. [Paris] **26:** 574–577. 1920.—Notes are given concerning the origin of 34 species of this genus that have been introduced into cultivation.—*E. B. Payson.*

1416. HAINES, H. H. **Notes on Bridelia.** Jour. Botany **59:** 188–193. 1921.—The conclusion reached in the study of Indian species of *Bridelia* is that *B. montana* Hook. f. is not *B. montana* Willd. but a new species, *B. verrucosa. B. montana* Willd. is a widely distributed species including 3 varieties, one of which is new, *B. montana* var. *Stapfii.*—*S. H. Burnham.*

1417. HOEHNE, F. C. **Leguminosas forrageiras do Brasil, I. Meibomia Moehr. [Leguminous forage plants of Brazil, I. Meibomia Moehr.]** Anex. Mem. Inst. Butantan **1**[1]**:** 5–54. *Pl. 1–21, 3 photo.* 1921.—A brief résumé is given of the nomenclatorial history of *Meibomia.* This name, which was proposed exactly 50 years before *Desmodium* Desv., is accepted as valid. A synoptical key contrasts briefly the characters of the 24 recognized Brasilian species. Each of these species is described in detail and information given as to its geographical distribution. The forage value is indicated for certain species. The following new combinations are made: *Meibomia cajanifolia* (*Desmodium cajanifolium* DC.), *M. cuneata* (*Desmodium cuneatum* Hook. & Arn.), *M. discolor* (*Desmodium discolor* Vog.), *M. leiocarpa* (*Hedysarum leiocarpum* Spreng.), *M. aspera* (*Hedysarum asperum* Desv.), *M. triflora* (*Hedysarum triflorum* DC.),

M. bracteata (*Desmodium bracteatum* Mich.), *M. barbata* (*Nicolsonia barbata* DC.), *M juruensis* (*Desmodium juruense* Hoehne), *M. axillaris* (*Hedysarum axillare* Swartz), *M. adscendens* (*Desmodium adscendens* DC.), *M. uncinata* (*Desmodium uncinatum* DC.), *M. lunata* (*Desmodium lunatum* Huber), *M. incana* (*Hedysarum incanum* Swartz), *M. albiflora* (*Desmodium albiflorum* Salzm.), *M. mollis* (*Hedysarum molle* Vahl.), *M. physocarpa* (*Desmodium physocarpos* Vog.), *M. spiralis* (*Desmodium spirale* DC.), *M. platycarpa* (*Desmodium platycarpum* Benth.), *M. pachyrhiza* (*Desmodium pachyrhizum* Vog.), *M. sclerophylla* (*Desmodium sclerophyllum* Benth.), *M. subsecunda* (*Desmodium subsecundum* Vog.), *M. venosa* (*Desmodium venosum* Vog.).—*E. B. Payson.*

1418. Holm, Theo. **Studies in the Cyperaceae. XXIX. Carices Aerostachyae: Salinae Fries.** Amer. Jour. Sci. 49: 429–442. *8 fig.* 1920.—The author presents a detailed discussion of the species of *Carex* which were referred to the groups *Aerostacyae* Drejer and *Salinae* Fries.—*T. J. Fitzpatrick.*

1419. Holm, Theo. **Studies in the Cyperaceae. XXX. Carices Aerostachyae: Cryptocarpae nob.** Amer. Jour. Sci. 50: 159–168. *14 fig.* 1920.—This article is concerned with a critical and detailed study of *Carex cryptocarpa* C. A. Mey. and its immediate allies.—*T. J. Fitzpatrick.*

1420. Jahandiez, E. **Les Euphorbes cactoïdes du nord-ouest de l'Afrique. [The cactus-like Euphorbias of northwest Africa.]** Rev. Gén. Bot. 33: 177–182. *Pl. 39–41.* 1921.—*Euphorbia canariensis L., E. resinifera* Berg. & Schmidt, *E. Beaumierana* Hook. f. & Coss., and *E. Echinus* Hook. f. & Coss. are redescribed and the first 3 figured.—*J. C. Gilman.*

1421. Lecomte, Henri. **Eberhardtia, genre nouveau de la famille des Sapotacées. [Eberhardtia, a new genus of the Sapotaceae.]** Bull. Mus. Hist. Nat. [Paris] 26: 345–348. *1 fig.* 1920.—The author describes **Eberhardtia**, a new genus, and refers to it 3 species from southeastern Asia. The new species and new combinations are as follows: *E. tonkinensis* (generic type), *E. Krempfii*, and *E. aurata* (*Planchonella aurata* Pierre). The new genus is to be placed near *Bumelia* but closer to *Monniera* and *Lecomtedoxa*.—*E. B. Payson.*

1422. Lecomte, Henri. **Faucherea: genre nouveau de la famille des Sapotacées. [Faucherea; a new genus of the Sapotaceae.]** Bull. Mus. Hist. Nat. [Paris] 26: 245–251. *Fig. 1–4.* 1920.—A new genus of Madagascan trees is characterized and its 4 known species are described and illustrated. It differs from *Labourdonnaisia* by the isomery of the floral envelopes and by the presence of definite staminodia. The calyx resembles that of *Palaquium* but the staminodia serve to distinguish the new genus. **Faucherea** is without doubt closely related to the American genus *Achras*, from which it may be separated by the 6 (instead of 12) cells of the ovary. The absence of appendages to the corolla lobes does not permit of its confusion with *Manilkara*. The following new combinations and new species are proposed: *Faucherea hexandra* (*Labourdonnaisia hexandra* H. Lec.), *F. Thouvenotii*, *F. laciniata*, and *F. parvifolia.* —*E. B. Payson.*

1423. Lecomte, Henri. **Une Sapotacée nouvelle du Congo. [A new sapotaceous plant from the Congo.]** Bull. Mus. Hist. Nat. [Paris] 26: 534–539. *Fig. 1–2.* 1920.—A new species of *Mimusops*, *M. Le Testui*, is described and illustrated, and a new section, *Autranella*, proposed to contain it.—*E. B. Payson.*

1424. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. V, pt. 6. *161–185, pl. 188–191.* William Applegate Gullick: Sydney, May, 1921.—The present part contains descriptions, synonymy, notes, and illustrations of the following species: *E. tetragona* F. v. M., *E. eudesmioides* F. v. M., *E. ebbanoensis* Maiden sp. nov., *E. Andrewsi* Maiden, *E. angophoroides* Baker, *E. kybeanensis* Maiden & Cambage, *E. eremophila* Maiden, and E. *decipiens* Endl.—*J. M. Greenman.*

1425. Pearsall, William Harrison. **Hagstrom's critical researches on the Potamogetons.** Bot. Soc. and Exchange Club British Isles Rept. 5: 701–713. 1919 [1920].

1426. Pellegrin, F. **De quelques Macrolobium (Légumineuses-Césalpiniées) du Gabon. [Concerning some Macrolobiums (Leguminosae-Caesalpineae) of Gabun.]** Bull. Mus Hist. Nat. [Paris] 26: 551–554. 1920.—Three new species of *Macrolobium* are described, *M. limosum, M. mayombense*, and *M. Klainei*.—*E. B. Payson.*

1427. Pellegrin, F. **Le bombi du Gabon, Parinarium Sargosii Pellegrin (Rosacées-Chrysobalanées). [The bombi of Gabun, Parinarium Sargosii Pellegrin (Rosaceae-Chrysobalaneae).]** Bull. Mus. Hist. Nat. [Paris] 26: 349–350. 1920.—*Parinarium Sargosii* is described as new to science. This is a valuable timber tree of western Africa, known locally as "bombi," of which a large amount is available to commerce.—*E. B. Payson.*

1428. Poisson, H. **Contribution à l'histoire des Nepenthes malgaches. [Contribution to the history of the Madagascan Nepenthes.]** Bull. Mus. Hist. Nat. [Paris] 26: 436–440. *1 pl.* 1920.—Information is given concerning the introduction of *Nepenthes madagascarensis* Poir. and *N. Pervillei* Blume into France.—*E. B. Payson.*

1429. Schlechter, R., e F. C. Hoehne. **Contribuições ao conhecimento das Orquidaceas do Brasil I. [Contributions to the knowledge of the Orchidaceae of Brazil I.]** Anex. Mem. Inst. Butantan 1^2: 5–48. *Pl. 1–11, 1 photo.* 1921.—This paper is the first of a series on the orchid flora of Brazil that the authors propose to publish from time to time. The species considered in more or less detail in the present paper were mostly collected in São Paulo and Minas Gerais. Synonyms and exsiccatae are cited. The authors desire communications concerning Brazilian orchids. A brief review is given of the present status of knowledge of the orchid flora of various parts of Brazil and South America. The following new species and new combinations are made: *Habenaria Hoehnei* Schl., *H. Gehrtii, H. butantanensis, H. melanopoda, H. pleiophylla, H. minarum, Sarcoglottis butantanensis* (*Spiranthes butantanensis* Hoehne), *Lyroglossa Griesebachii* Schl. (*Spiranthes Griesebachii* Cogn.), *Stelis pauloensis, S. inaequisepala, Pleurothallis albipetala, Epidendrum minarum, Cyrtopodium falcilobum, C. lissochiloides, Maxillaria Hoehnei* Schl.—*E. B. Payson.*

1430. Standley, Paul Carpenter. **Rubiales. Rubiaceae (pars).** North Amer. Flora 32: 87–158. 1921.—In continuation of his treatment of this family the author presents a revision of 40 genera with generic and specific descriptions, keys, and the citation of synonyms. The following new species are described and new combinations made: *Pinarophyllon bullatum, Deppea Purpusii, D. excelsa* (*Psychotria excelsa* HBK.), *Bouvardia bouvardioides* (*Hedyotis bouvardioides* Seem.), *B. tenuifolia, B. subcordata, B. villosa, B. macrantha, B. heterophylla, B. quinquenervata, B. Rekoi, B. dictyoneura, B. Rosei, B. induta* (*B. longiflora* var. *induta* Robinson), *B. Langlassei, B. erecta* (*Catesbaea erecta* DC.), *B. latifolia, Ravnia Pittieri, Hillia panamensis, Exostema crassifolium, E. Shaferi, E. velutinum, E. barbatum, E. indutum, Coutarea pterosperma* (*Portlandia pterosperma* Wats.), *Urceolaria involucrata* (*Fuchsia involucrata* Sw.), *Sommera subcordata, S. grandis* (*Petesia grandis* Bartl.), *Tontanea canescens* (*Coccocipsilum canescens* Willd.), *T. tenuis* (*Coccocipsilum tenue* Urban), *T. herbacea* (*Coccocipsilum herbaceum* Lam.), *T. hispidula, T. hirsuta* (*Coccocipsilum hirsutum* Bartl.), *T. pleuropoda* (*Geophila pleuropoda* Donn. Smith).—*E. B. Payson.*

1431. Wildeman, Em. de. **Notes sur quelques espèces congolaises du genre Ochna Schreb. [Notes on some species of the genus Ochna Schreb. from the Congo.]** Rev. Zool. Africaine Suppl. Bot. 7: B29–B40 1919.—These species are difficult of determination because the flower and leaves often appear at different times. A complete revision of this genus is yet to be made. The author describes the new species and gives the habitat for all those that he reviews. The species treated are: *Ochna arenaria* De Wild. & Th. Durand, *O. Bequaerti* n. sp., *O. Buettneri*, Engler & Gilg, *O. congoensis* Gilg, *O. congoensis* var. *microphylla* Gilg, *O. Debeerstii* De Wild., *O. Gilgiana* Engler, *O. Gilletiana* Gilg, *O. Hocki* n. sp., *O. Hoffmanni, O. Homblei* n. sp., *O.*

ituriensis n. sp., *O. katangensis* De Wild., *O. Laurentiana* Engler ex De Wild. & Th. Durand, *O. manikensis* n. sp., *O. membranacea* Oliv., *O. multiflora* DC., *O. pulchra* Hook., *O. quanjensis* Buettn., *O. Sapini* n. sp., *O. Schweinfurthiana* Fr. Hoffm., *O. suberosa* n. sp., and *O. Welwitschii* Rolfe.—*Henri Micheels.*

1432. WILDEMAN, EM. DE. **Notes sur quelques espèces congolaises du genre Ouratea Aubl. [Notes on some species of the genus Ouratea Aubl. from the Congo.]** Rev. Zool. Africaine Suppl. Bot. **7**: B41–B71. 1920.—The following species are discussed as to synonymy and habitat and the new species characterized: *Ouratea bracteata* Gilg, *O. brunneo-purpurea* Gilg, *O. bukobensis* Gilg, *O. Cabrae* Gilg, *O. coriacea* De Wild. & Th. Durand, *O. reticulata* var. *Schweinfurthii* Engler, *O. densiflora* De Wild. & Th. Durand, *O. Dewevrei* De Wild. & Th. Durand, *O. Dupuisi* (Van Tiegh.) Th. & Hel. Durand, *O. elongata* (Oliv.) Engler, *O. engama* n. sp., *O. Flamignii* n. sp., *O. floribunda* n. sp., *O. gentili* n. sp., *O. gymnoura* Gilg & Mildbr., *O. intermedia* De Wild., *O. laevis* De Wild. & Th. Durand, *O. ituriensis* Gilg & Mildbr., *O. latepaniculata* n. sp., *O. Laurenti* n. sp., *O. laxiflora* De Wild. & Th. Durand, *O. Ledermanniana* Engler, *O. likemiensis* n. sp., *O. longipes* (Van Tiegh.) Th. & Hel. Durand, *O. macrobotrys* Gilg, *O. Mildbraedii* Gilg, *O. pellucida* De Wild. & Th. Durand, *O. Poggei* (Engler) Gilg, *O. pseudospicata* Gilg, *O. Pynaerti* n. sp., *O. reticulata* (Pal. Beauv.) Engler, *O. affinis* (Hook.) Engler, *O. Arnoldiana* De Wild. & Th. Durand, *O. bracteolata* Gilg & Mildbr., *O. calophylla* Engler, *O. febrifuga* Engler & Gilg, *O. nigrioneura* Gilg, *O. refracta* De Wild. & Th. Durand, *O. rigida* n. sp., *O. subumbellata* Gilg, *O. Thonneri* De Wild., and *O. Vanderysti* n. sp.—*Henri Micheels.*

1433. WILDEMAN, EM. DE. **Sur quelques espèces congolaises de la famille des Sapotacées. [Concerning some species of the family Sapotaceae from the Congo.]** Rev. Zool. Africaine Suppl. Bot. **7**: B1–B28. 1919.—The author is concerned principally with the genus *Omphalocarpum*, an endemic genus of tropical Africa. An analytic key is given that shows the relationship of the new species with those previously known. Descriptions of the following species are given: *Omphalocarpum Bequaerti* n. sp., *O. bohmanehense* De Wild., *O. Brieyi* n. sp., *O. injoloense* n. sp., *O. Lescrauwaeti* n. sp., *O. Lujae* n. sp., *O. Mortehani* n. sp., *O. pedicellatum* n. sp., *O. sankuruense* De Wild., *O. sphaerocarpum* n. sp., *Sersalisia Malchairi* n. sp., *Bakerisideroxylon Sapini* n. sp., *Chrysophyllum longifolium* n. sp., *C. Sapini* n. sp., *C. Brieyi* n. sp., **Bequaertiodendron** n. gen., *B. congolense* n. sp., *Tridesmostemon Claessensi* n. sp., *T. Mortehani* n. sp., *Mimusops Bequaerti* n. sp., *M. Boonei* n. sp. The habitats are also indicated for *Sideroxylon stipulatum* (Radlkf.) Engler, *Synsepalum dulcificum* Daniell, *S. longeacuminatum* De Wild., *Pachystela cinerea* var. *cuneata* (Radlkf.) Engler, *Chrysophyllum africanum* A. DC., *C. Lacourtianum* De Wild., *C. Laurenti* De Wild., and *Mimusops angolensis* Engler.—*Herni Micheels.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. LIVINGSTON, *Editor*
S. F. TRELEASE, *Assistant Editor*

1434. ANONYMOUS. **Bureau Central de la Commission de la Méditerranée. [Central Bureau of the Commission of the Mediterranean.]** Bull. Commission Internat. Explor. Sci. Mer Méditerranée **6**: 1–20. 1921.—Preliminary reports are presented of work done by various countries bordering on the Mediterranean.—*T. C. Frye.*

1435. ANONYMOUS. **Commission Internationale pour l'exploration scientifique de la Mer Méditerranée. [International Commission for the scientific exploration of the Mediterranean Sea.]** Bull. Commission Internat. Explor. Sci. Mer Méditerranée **4**: 1–7. 1920.—A report is made on what the Greek committee proposes to do.—*T. C. Frye.*

1436. Anonymous. **Proces-verbaux des Sous-Commissions. [Transactions of the Sub-Commissions.]** Bull. Commission Internat. Explor. Sci. Mer Méditerranée 2: 1–23. 1920.—The organization of the Central Bureau is given, with a statement of what it proposes to do. The work proposed for Spain and France by the committees from these countries is outlined.—*T. C. Frye.*

1437. Anonymous. **The art of prolonging the life of plants.** Sci. Amer. Monthly 3: 117. 1921.

1438. Artschwager, Ernst, and E. M. Smiley. **Dictionary of botanical equivalents.** *137 p.* Williams & Wilkins Co.: Baltimore, 1921.—A glossary of botanical terms and plant names in 2 alphabets, French-English and German-English. The German list is much more complete than the French, which covers only 10 pages as compared with 121 pages of the German. The latter includes common names of plants, followed by both the English common name and the scientific name. The French list includes no plant names.—The preface states that the editors have not attempted a complete compilation of French and German terms, but have aimed to produce a practical handbook with blank pages interleaved for inserting additions. It should be of service to users of foreign botanical literature, as it contains definitions of terms not found in the usual French and German dictionaries.—*E. R. Oberly.*

1439. Babe, E. **Coeficiente de digestibilidad del palmiche. [Coefficient of digestibility of the fruit of the royal palm.]** Rev. Agric. Com. y Trab. [Cuba] 4: 474–477. *2 fig.* 1921.

1440. Bevan, W. **Wine making.** Cyprus Agric. Jour. 16: 8. 1921.—The author comments on the reception and value of a series of lectures on the art of wine making given by Assistant Inspector A. K. Klokaris to the vineyardists of the Island.—*W. Stuart.*

1441. Hansen, Albert A. **Our disappearing wild plants.** Science 53: 178–180. 1921 [Illustrated address delivered before the Botanical Society of Washington, D. C.]—The author pleads for the perpetuation of the native flora by avoiding thoughtless destruction or commercial exploitation. He suggests that this be accomplished by enlisting the cooperation of the public through the agency of schools, churches, etc., rather than through legislation. Wild-life gardens and house gardens are also suggested.—*C. J. Lyon.*

1442. Le Plastrier, C. M. **Nature and the Naturalist.** Australian Nat. 4: 182–192. 1921.

1443. Lillie, R. S. **The place of life in nature. How is it related to the cosmos, the greater part of which is non-living?** Sci. Amer. Monthly 3: 112–117. 1921. [Paper read at a meeting of the Royce Club, Harvard University, April 11, 1920. Reprinted from Jour. Phil. Psychol. and Sci. Methods 17: No. 18, Aug. 26, 1920.]

1444. Magrini, G. **Programme des recherches à exécuter par la Mission Italienne chargée de l'exploration scientifique des Détroits de Constantinople. [Program of research to be carried out by the Italian commission assigned the scientific exploration of the Dardanelles.]** Bull. Commission Internat. Explor. Sci. Mer Méditerranée 5: 1–20. 1921.

1445. Monaco, [Prince] Albert de. **Discours sur l'ocean. [Lecture on the ocean.]** Bull. Inst. Oceanograph. Monaco 392. *16 p.* 1921. [French translation of the author's English lecture before the National Academy of Sciences at Washington, D. C., April 25, 1921.]

1446. Oxner, M., et M. Knudsen. **Manuel pratique de l'analyse de l'eau de mer. I. Chloruration par la méthode de Knudsen. [A practical manual for the analysis of sea water. I. Chlorine determination by Knudsen's method.]** Bull. Commission Internat. Explor. Sci. Mer Méditerranée 3: 1–36. 1920.—Detailed instructions are given with calculations and examples.—*T. C. Frye.*